RESOLUTION NO. 24-9389

A RESOLUTION OF THE CITY OF SANTA CLARA, CALIFORNIA, ACCEPTING THE CITY OF SANTA CLARA BENTON STREET BIKEWAY PLANNING STUDY

WHEREAS, in December 2022, the City Council approved retaining Alta Planning & Design to assist with development of the Benton Street Bikeway Planning Study ("Study");

WHEREAS, the development of the Study was a collaborative effort involving the public, various stakeholders, the Santa Clara Bicycle and Pedestrian Advisory Committee, the Santa Clara Senior Advisory Commission, the Santa Clara Parks and Recreation Commission, and the Santa Clara Youth Commission;

WHEREAS, the Study identifies concepts for infrastructure improvements designed to encourage bicycling and walking as a safe and healthy alternative to the motor vehicle;

WHEREAS, the City conducted significant community outreach to understand the issues and obtain feedback on concept alternatives, and this outreach consisted of five community meetings, six pop-up events, one City Council study session, City Council briefings, three online surveys, social media, street signs posted along the corridor, mailed notices, a project website, a project email address, a project phone number, and City website;

WHEREAS, the Study is consistent with the goals and policies of the City of Santa Clara Complete Streets Policy, Bicycle Plan Update 2018, and the mobility and transportation element of the 2010-2035 General Plan;

WHEREAS, at its June 17, 2024 meeting, the Santa Clara Bicycle and Pedestrian Advisory Committee recommended City Council approve the Study; and,

WHEREAS, the acceptance of the Plan is exempt from California Environmental Quality Act (CEQA) review pursuant to Sections 15378(a) and 15301(c) of the California Code of Regulations.

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NOW THEREFORE, BE IT RESOLVED BY THE CITY OF SANTA CLARA AS FOLLOWS:

1. That the City of Santa Clara hereby accepts the Benton Street Bikeway Planning Study as attached and referenced herein.

2. The City of Santa Clara hereby approves the roadway concept entitled “Two Lanes, Buffered Bike Lanes, Parking on Both Sides” as the preferred alternative for the 60-foot-wide section of Benton Street.

3. The City of Santa Clara hereby approves the roadway concept entitled “Two Lanes, Buffered Bike Lanes, Center Turn Lane, Parking on Both Sides” as the preferred alternative for the 64-foot-wide section of Benton Street.

4. The City of Santa Clara hereby approves the roadway concept entitled “Bicycle Boulevard with Speed Cushions, Parking on Both Sides” as the preferred alternative for the 38-foot-wide section of Benton Street.

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5. Direct City staff to return to Council with appropriate actions to implement the preferred roadway design.

6. Effective date. This resolution shall become effective immediately.

I HEREBY CERTIFY THE FOREGOING TO BE A TRUE COPY OF A RESOLUTION PASSED AND ADOPTED BY THE CITY OF SANTA CLARA, CALIFORNIA, AT A REGULAR MEETING THEREOF HELD ON THE 12TH DAY OF NOVEMBER, 2024, BY THE FOLLOWING VOTE:

AYES:	COUNCILORS:	Becker, Chahal, Hardy, Jain, and Watanabe, and Mayor Gillmor
NOES:	COUNCILORS:	None
ABSENT:	COUNCILORS:	Park
ABSTAINED:	COUNCILORS:	None

ATTEST: _____
NORA PIMENTEL, MMC
ASSISTANT CITY CLERK
CITY OF SANTA CLARA

Attachments incorporated by reference:
1. Benton Street Bikeway Planning Study

City of Santa Clara

Benton Street Bikeway Planning Study

DRAFT FINAL | May 2024

Prepared by

alta

City of Santa Clara
The Center of What's Possible

Acknowledgments

City Council

Lisa M. Gillmor
Mayor

Kathy Watanabe
District 1

Raj Chahal
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Karen Hardy
District 3

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Stakeholders

Santa Clara Unified School District

Santa Clara High School

Santa Clara Valley Transportation Authority

County of Santa Clara

Boards and Commissions

Bicycle and Pedestrian Advisory Committee

Senior Advisory Commission

Parks and Recreation Commission

Youth Commission

Consultant Team

Alta Planning + Design

Kimley-Horn

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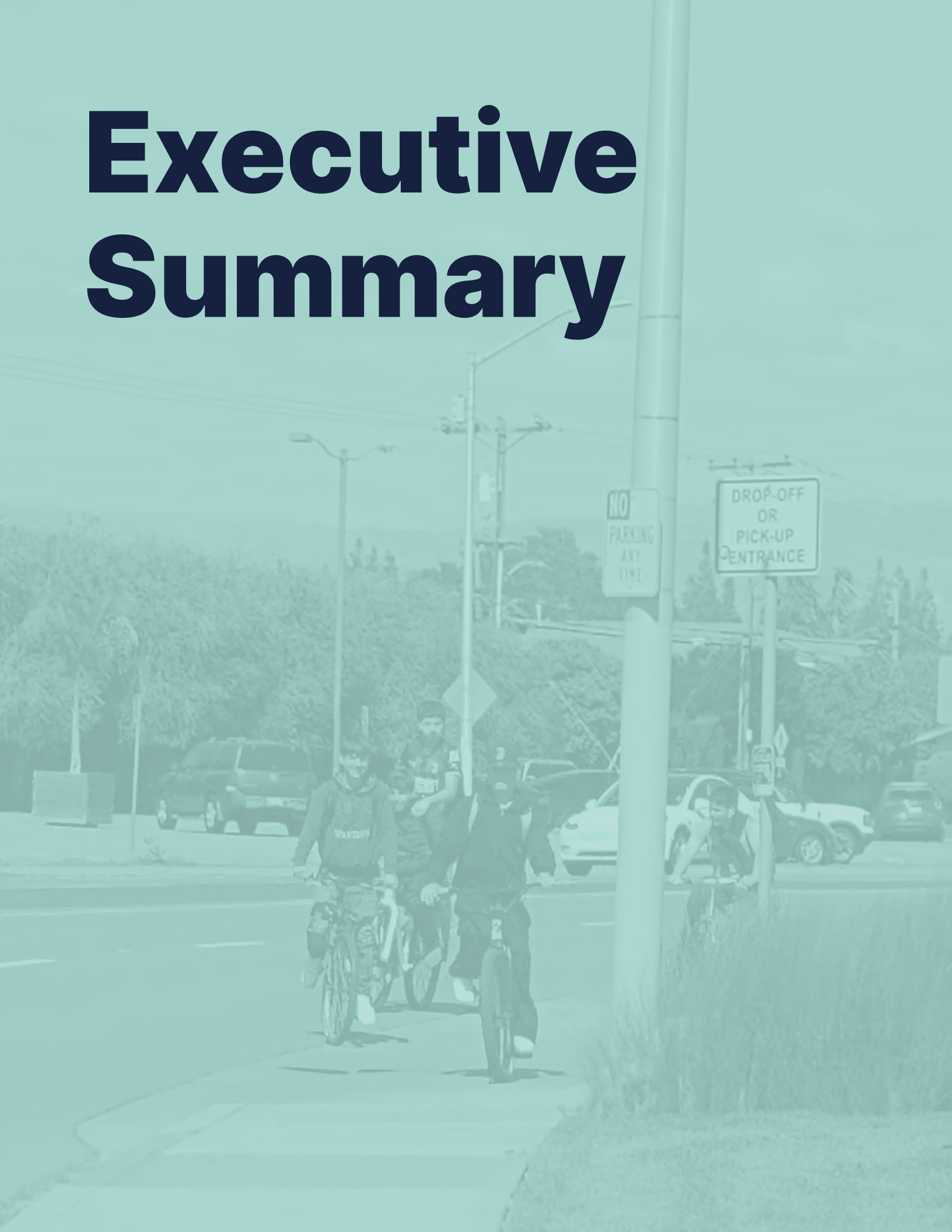
Executive Summary



Scope of Study

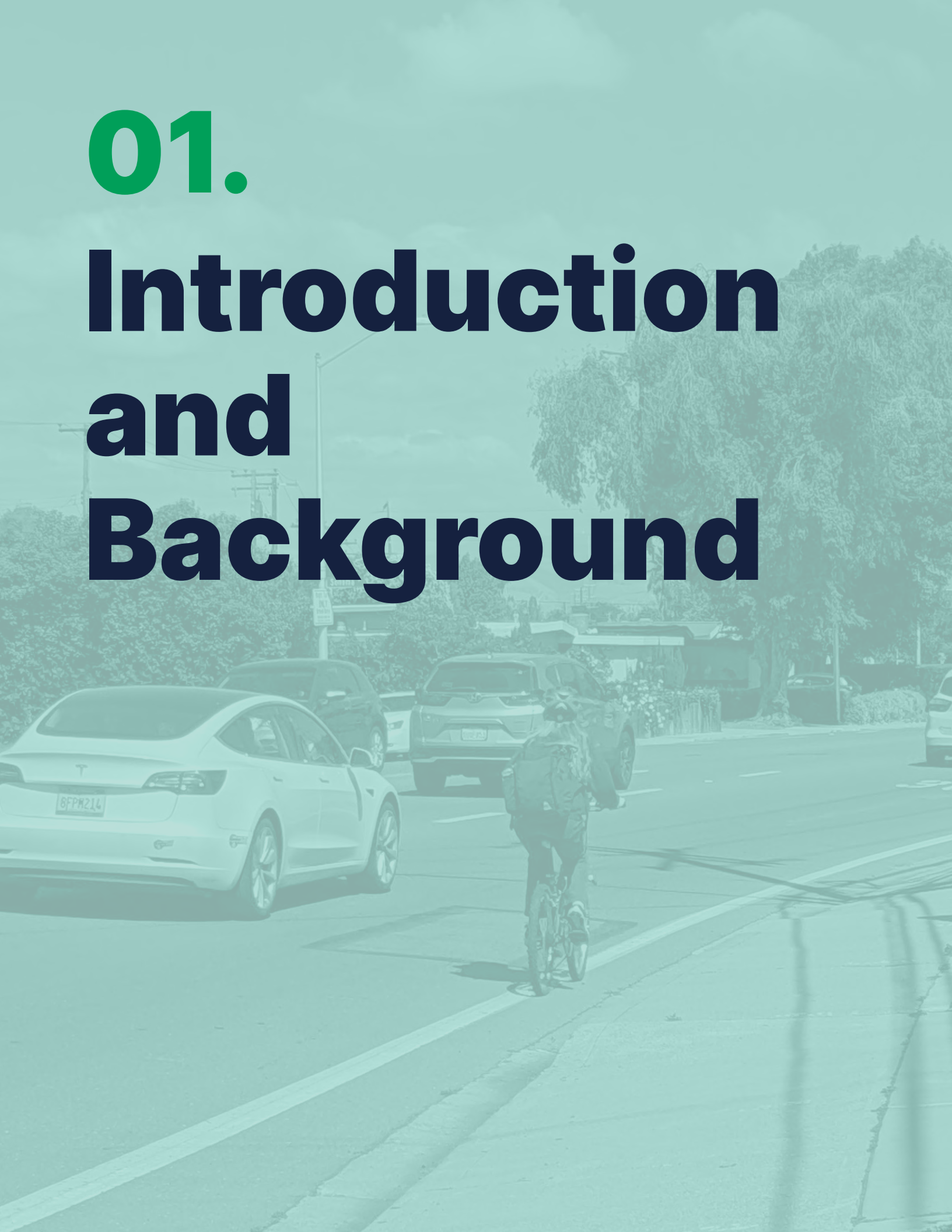
The City and project consultant, Alta Planning + Design, began working on the Benton Street Bicycle Planning Study in January 2023 and expect to be completed by fall 2024. The study will identify the most feasible design to reallocate roadway space to provide 2.7 miles of bike facilities along Benton Street from Dunford Way to Lincoln Street. The goal of the study is to identify bicycle infrastructure improvements that will close bicycle network gaps, increase mobility, and encourage the public to choose more sustainable modes of transportation. The study also includes reviewing potential options for parking or lane removal. The project team has invited nearby residents, business owners, public health professionals, school staff, commuters, and community leaders to take part in the process. This report contains a traffic and parking analysis, street design concepts, and a discussion on opportunities and constraints of the potential design options.

It should be noted that the study is only a planning level document and does not include design, environmental review, or construction of any alternative. Additional funds would be required to design and construct the preferred alternative.

City Council Preferred Concept

To be determined

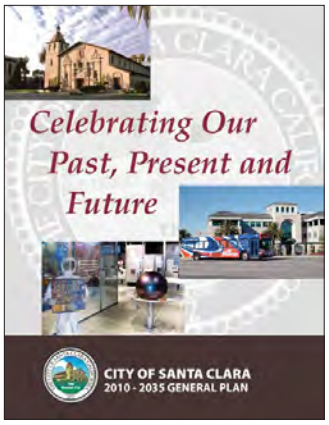
01.
Introduction and Background



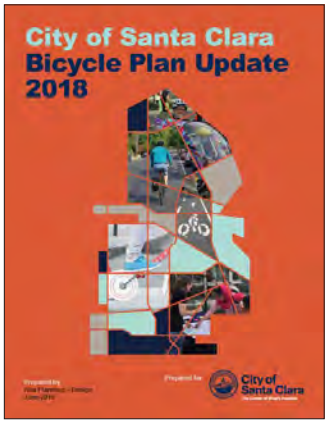
Origins of the Study

The Benton Street segment from Dunford Way to Lincoln Street was identified as a priority project in the *City of Santa Clara's Bicycle Plan Update 2018*, and it was included in the *City of Santa Clara 2010-2035 General Plan* and *Santa Clara Valley Transportation Authority (VTA) Countywide Bicycle Plan Update 2018*. The Benton Street Bikeway Study also works toward implementation of the City's Complete Streets Policy, Resolution 18-8593, and *City of Santa Clara Climate Action Plan* by identifying strategies to improve connectivity for people biking and walking and reduce their level of traffic stress to encourage mode shifts from vehicles toward more sustainable modes such as biking and walking.

In January 2023, the City Council approved an agreement for a Bikeway Study for Benton Street ("Study"). This Study identifies the feasibility of bicycle improvements along 2.7 miles of Benton Street from Dunford Way to Lincoln Street, to better enhance safety and comfort for all.



City of Santa Clara 2010-2035 General Plan



City of Santa Clara Bicycle Plan Update 2018

Santa Clara Countywide Bicycle Plan Update 2018

City of Santa Clara Climate Action Plan

Study Objectives

The Study identifies bicycle improvements necessary to expand the existing active transportation network, close network gaps, provide greater connectivity to public transportation, increase mobility, and encourage the public to choose more sustainable modes of transportation. The Study also includes a review of potential options for parking removal or lane reductions. It should be noted that this project is only a planning-level effort and does not include design, environmental review, or construction of any concept.

Timeline

In developing the Study, there were four main phases of planning:

- Phase 1: Information Gathering and Existing Conditions Analysis
- Phase 2: Develop and Share Roadway Concepts
- Phase 3: Review Technical Analysis and Revised Concepts
- Phase 4: City Council Review and Consideration

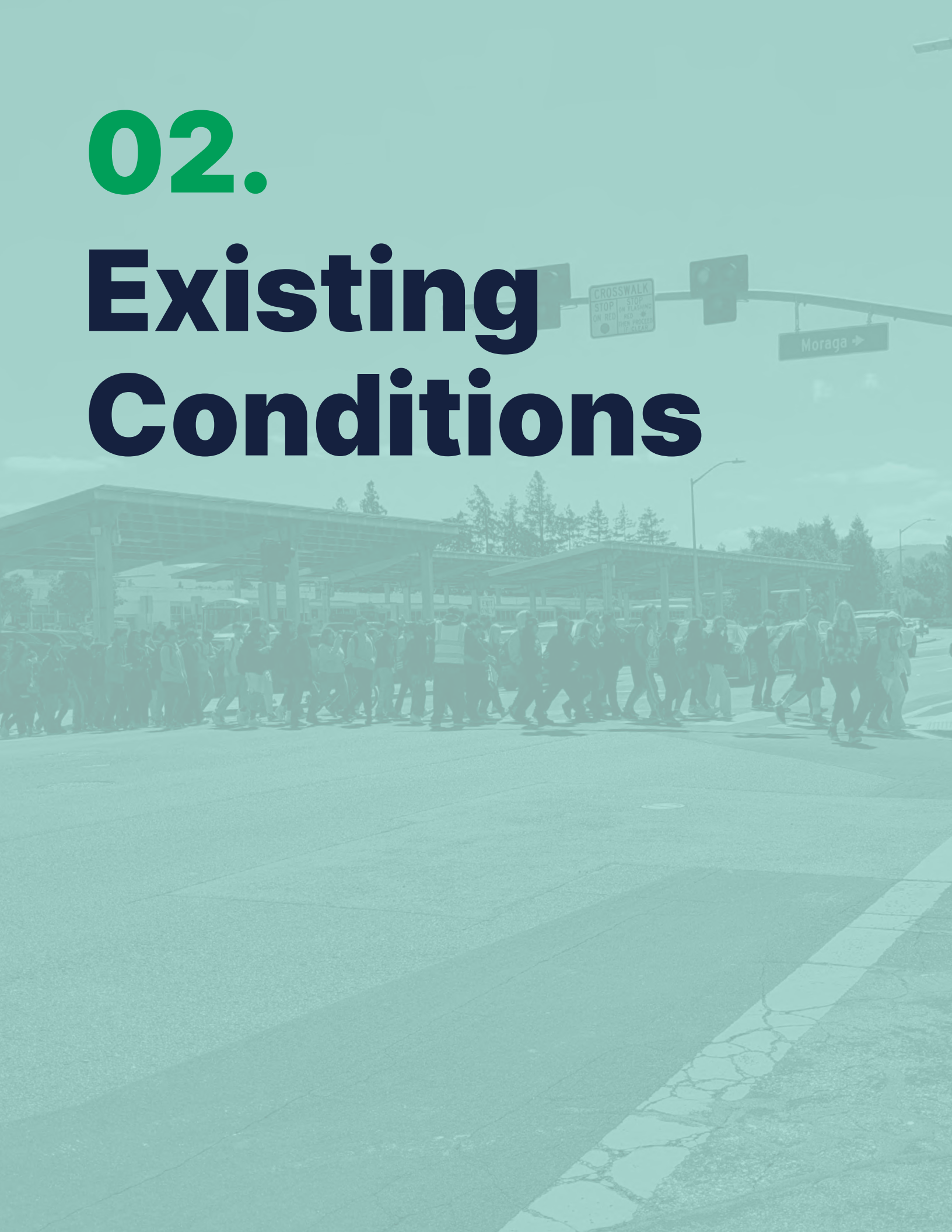
A graphic of the project timeline is shown in **Figure 1.**

Figure 1. Benton Street Bikeway Study Schedule

Santa Clara High School student bicycling eastbound in the narrow shoulder on Benton Street near Kiely Boulevard.

02.

Existing Conditions



Roadway Characteristics

This Study evaluates 2.7 miles of Benton Street from Dunford Way to Lincoln Street. From Dunford Way to Lawrence Expressway is typically 60 feet wide. This is a 0.1-mile east-west segment with two travel lanes, and a posted speed limit of 25 to 30 miles per hour (mph). From Lawrence Expressway to Maryann Drive, the roadway is typically 64 feet wide. This 1.7-mile east-west segment has four to five travel lanes, and the posted speed limit is 25 to 30 mph. Finally, from Maryann Drive to Lincoln Street, the roadway is typically 38 feet wide. This 0.8 mile east-west segment has two lanes and a posted speed limit of 25 mph.

The Benton Street Corridor is primarily fronted by residential uses and schools, including Santa Clara High School (SCHS). There are also many important community destinations along or just off the corridor, including Carmichael Park, Central Park, Carli Park, and the San Tomas Aquino Creek Trail.

Figure 2. Map of Benton Street Corridor Study Area

Existing conditions along the Benton Street Corridor at Kiely Boulevard (left) and Live Oak Drive (right).

Study Area Observations

At Pomeroy Avenue and Benton Street

- Even though Pomeroy has bulb outs, cars turned between pedestrians, not waiting for them to be out of the intersection. The westbound left turn from Benton to Pomeroy does not have a controlled turn, and the light aligns with pedestrian crossing signal.
- Cyclists primarily used sidewalks.
- There was heavy vehicle traffic, with cars close to pedestrians.
- Pedestrian crossing was shared with vehicles turning.

At Moraga Street and Benton Street

- Vehicles made U-turns and parked in red zones.
- Chaos and visibility issues were due to driver behavior.
- Parents utilized parking lot at northwest corner have trouble getting in and out.
- Drivers were not mindful of pedestrians crossing at school driveways.

At Kiely Boulevard and Benton Street

- Buses, pedestrians, and cyclists primarily traveled eastbound.
- Congestion at southwest corner of Kiely, where students go to 7-Eleven and parking lot.
- Eastbound cyclists rode in the right lane of the road when sidewalk filled with pedestrians.
- The sidewalk is narrow and feels close to high-speed traffic.
- Groups on sidewalk included students walking their bikes.
- Left-turn lane at Kiely backed up very far.
- Cyclists pinched at southeast corner going eastbound and weaving to avoid parked cars, a potential conflict with vehicles.
- Leading pedestrian intervals could help with vehicle conflict at corners.
- Some students rode bikes back to school on the road, and there were fewer vehicles after 3:30 p.m.

At San Tomas Expressway and Benton Street

- Drivers blocked the crosswalk to make right turns.
- Several students were observed passing the Expressway to continue eastbound.
- There is a tricky transition at eastbound Benton, where the bike lane ends, and several students rode onto the sidewalk for pedestrian crossing.

Traffic

The project team evaluated the time it currently takes to travel the entire length of the study corridor in a car at multiple periods (on a weekday morning between 7:00 and 9:00 a.m., midday between 1:30 and 3:30 p.m., and evening between 4:00 and 6:00 p.m., and on Saturday between 11:30 a.m. and 1:30 p.m.). During the busiest time of day going westbound (AM peak period from 7:00 to 9:00 a.m.), it takes 15 minutes and 39 seconds to travel the entire corridor. The AM peak period includes high school traffic, whereas PM peak period is minimally affected by high school traffic. During the busiest time of day going eastbound (PM peak period from 4:00 to 6:00 p.m.), it takes 13 minutes and 40 seconds to travel the entire corridor, as shown in **Table 1: Corridor Travel Time.**

The project team also modeled the traffic delay or Level of Service (LOS) at 36 intersections along the study corridor and surrounding streets. Based on the level of delay, each intersection gets a letter grade A through F. Intersections with LOS A through D meet City standards. Intersections with LOS E meet standards for El Camino Real (a state highway) and any County expressway. Otherwise, LOS E and F are considered substandard.

Of the 36 intersections studied, three are currently substandard in the AM peak period, and three are substandard in the PM peak period on weekdays, as shown in **Table 2: Corridor and Surrounding Networks Level of Service**. More detailed maps showing current and estimated LOS are shown in **Chapter 3: Corridor Alternative Concepts and Analysis**.

Table 1. Corridor Travel Time

Time Period	Corridor Travel Time (min:sec)
Westbound	
AM Peak	15:39
PM Peak	11:47
Midday	11:10
Saturday	09:22
Eastbound	
AM Peak	10:49
PM Peak	13:40
Midday	10:38
Saturday	09:25

Table 2. Corridor and Surrounding Networks Level of Service

Time Period	Meets Standard	Substandard
AM Peak	33	3
PM Peak	33	3
Midday	35	1
Saturday	36	0

Figure 3. Map of Benton Street Corridor Study Intersections

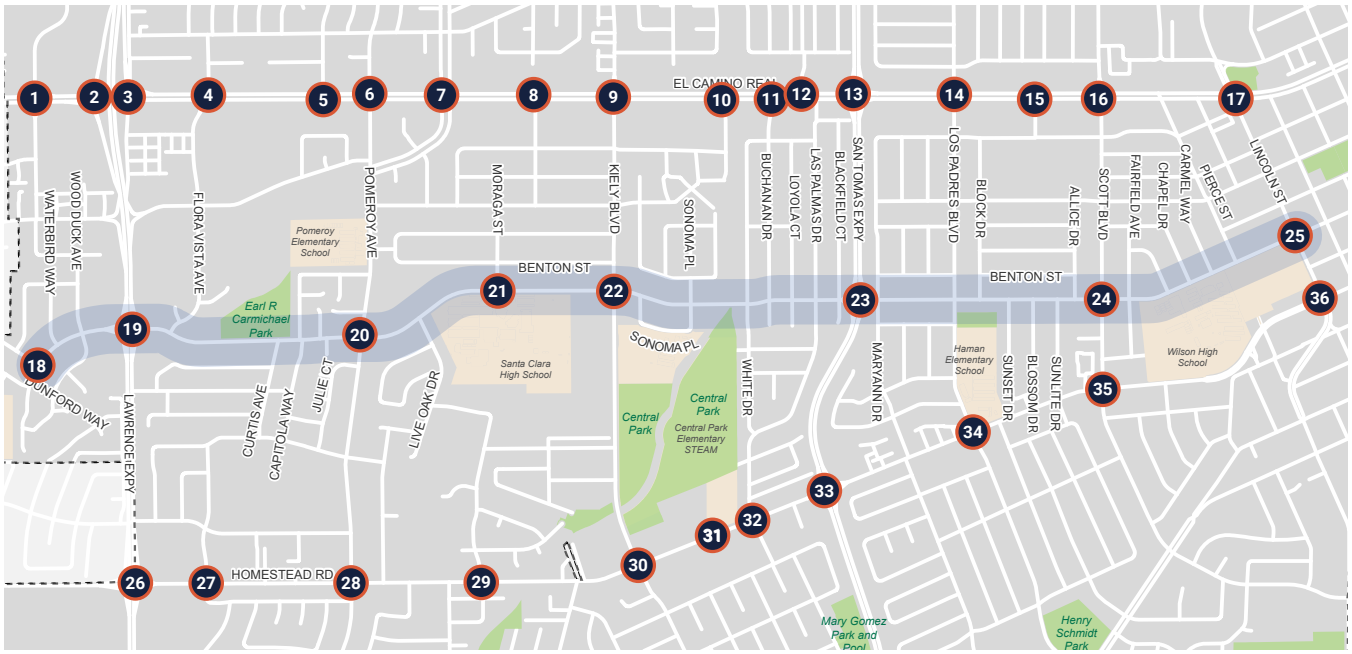


Table 3. Study Intersections

	Corridors (East-West)		
Cross Streets (North-South)	**El Camino Real**	**Benton Street**	**Homestead Road**
	1. Halford Ave	18. Dunford Way	26. Lawrence Expwy
	2. Lawrence Expwy (west)	19. Lawrence Expwy	27. Bing Dr/Princeton Way
	3. Lawrence Expwy (east)	20. Pomeroy Ave	28. Pomeroy Ave
	4. Flora Vista Ave	21. Moraga St	29. Pepper Tree Ln
	5. Nobili Ave	22. Kiely Blvd	30. Kiely Blvd
	6. Pomeroy Ave	23. San Tomas Expwy	31. Shopping Ctr-Libr. Driveway
	7. Calabazas Blvd	24. Scott Blvd	32. Layton St
	8. Alpine Ave	25. Lincoln St	33. San Tomas Expwy
	9. Bowers Ave / Kiely Blvd		34. Los Padres Blvd
	10. Bowe Ave		35. Scott Blvd
	11. Buchanan Dr		36. Winchester Blvd
	12. Morse Ln		
	13. San Tomas Expwy		
	14. Los Padres Blvd		
	15. McCormick Dr		
	16. Scott Blvd		
	17. Lincoln St		

Benton Street sees anywhere from 4,000 to 12,000 vehicles over the course of an entire day, with higher volumes over the weekends, as shown in **Table 4**.

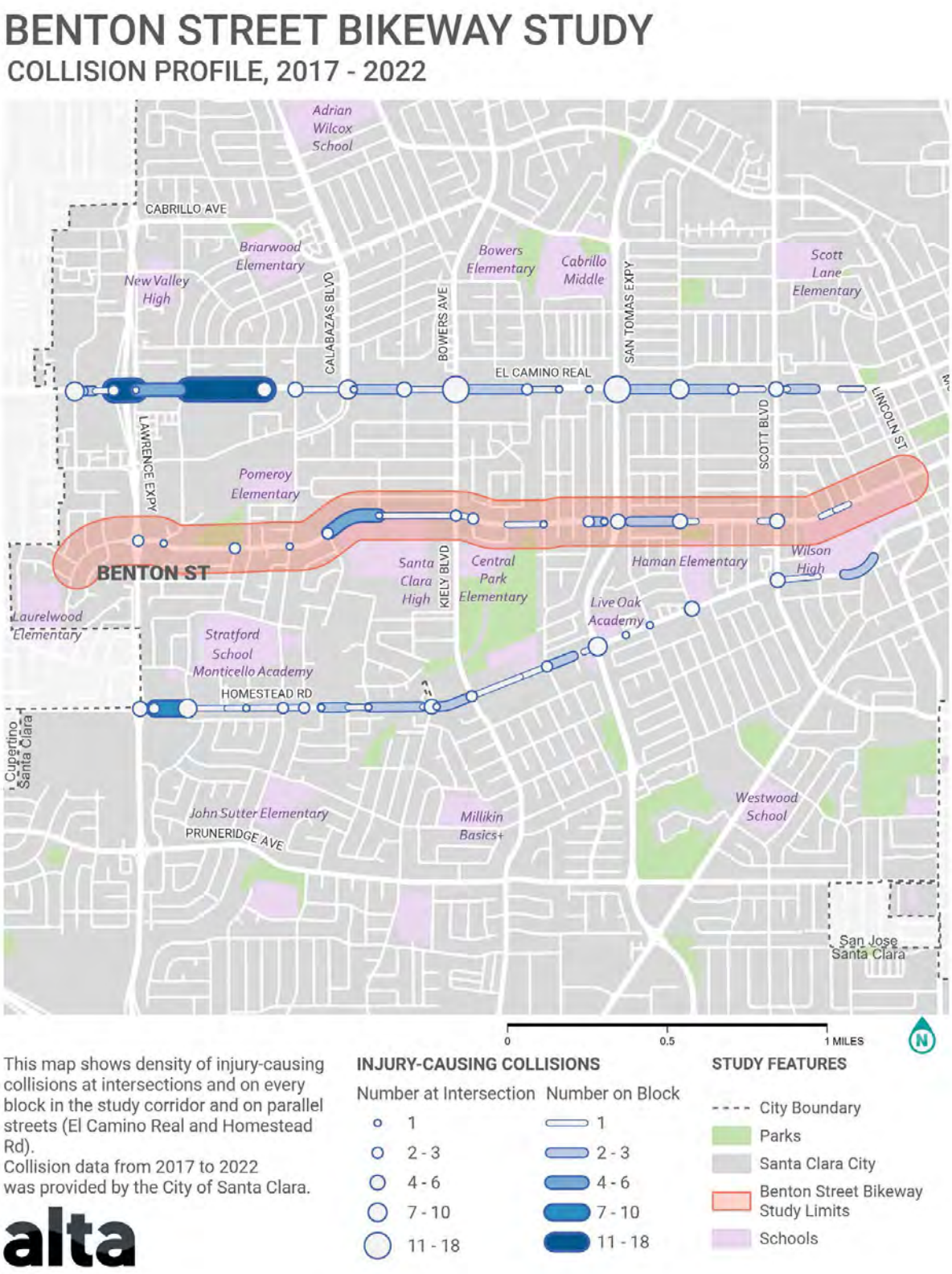
Safety

Between 2017 and 2022, there were 122 collisions along the Benton Study Corridor, with two resulting in serious injuries. These serious injuries occurred at the intersection with San Tomas Expressway and Pomeroy Avenue, and victims were older community members riding bicycles. No fatal collision was found along the Benton Study Corridor. Furthermore, of the 122 collisions, 16 involved bicyclists and four involved pedestrians. The primary crash factor was unsafe speeds (33 collisions), followed by auto right-of-way violation (22 collisions). Broadside and rear-end collisions made up 66% of the total collisions (34% and 32%, respectively). Almost two-thirds of the time pedestrians were struck (64%), they were crossing at intersections in crosswalks. Two of the four pedestrian-involved collisions were located near SCHS. Most bicycle-involved collisions occurred in two locations, one around SCHS (five bicycle-involved collisions) and the other around San Tomas Expressway (five bicycle-involved collisions). Additionally, most collisions occurred during the afternoon (2:00 to 5:00 p.m.), which includes afternoon dismissal from schools in the area, including SCHS. The results are summarized in **Figure 4** and **Figure 5**.

Table 4. Benton Street Average Daily Traffic Counts

#	Location		Eastbound	Westbound	Total
1	Flora Vista Ave	7-Day	4,633	4,945	9,578
		Weekday (T-Th)	4,316	4,793	9,109
		Weekend (Sat, Sun)	4,989	5,136	10,125
2	Pomeroy Ave	7-Day	4,822	4,950	9,772
		Weekday (T-Th)	4,406	4,753	9,159
		Weekend (Sat, Sun)	5,225	5,209	10,434
3	Moraga St	7-Day	5,205	5,190	10,395
		Weekday (T-Th)	4,482	4,759	9,241
		Weekend (Sat, Sun)	5,863	5,632	11,494
4	Buchanan Ct	7-Day	5,281	5,868	11,149
		Weekday (T-Th)	4,710	5,490	10,200
		Weekend (Sat, Sun)	5,791	6,281	12,072
5	Sunset Dr	7-Day	2,939	2,909	5,848
		Weekday (T-Th)	2,593	2,694	5,287
		Weekend (Sat, Sun)	3,207	3,123	6,329
6	Pierce St	7-Day	2,530	2,196	4,726
		Weekday (T-Th)	2,188	1,974	4,161
		Weekend (Sat, Sun)	2,789	2,410	5,199

Figure 4. Benton Street Collision Profile

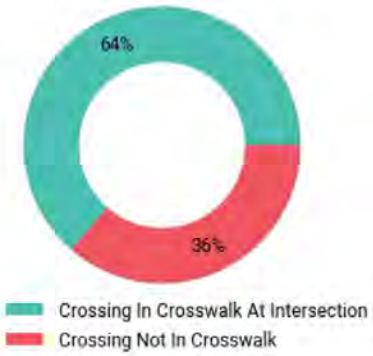


COLLISION CHARACTERISTICS
ALL COLLISIONS ON BENTON STREET

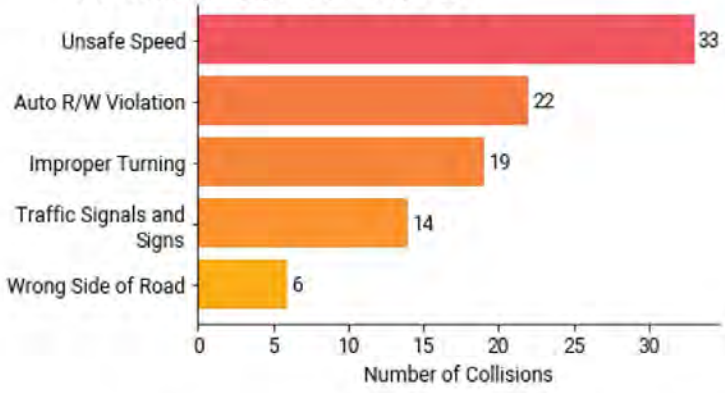
	Total	KSI	Bicycle	Pedestrian
All Collisions	122	2	16	4
Alcohol Involved	5	0	0	0
Speeding Involved	33	1	3	0
Collisions After Dark	40	2	5	2

Two of the Killed or Seriously Injured (KSI) crashes on Benton St involved bicycles. One occurred near Live Oak Drive and one at the San Tomas Expressway. There were no pedestrian KSIs.

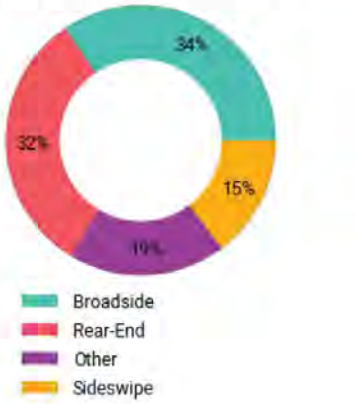
PEDESTRIAN LOCATION WHEN STRUCK



PRIMARY CRASH FACTOR



TYPE OF COLLISION



COLLISION SEVERITY BY TIME OF DAY

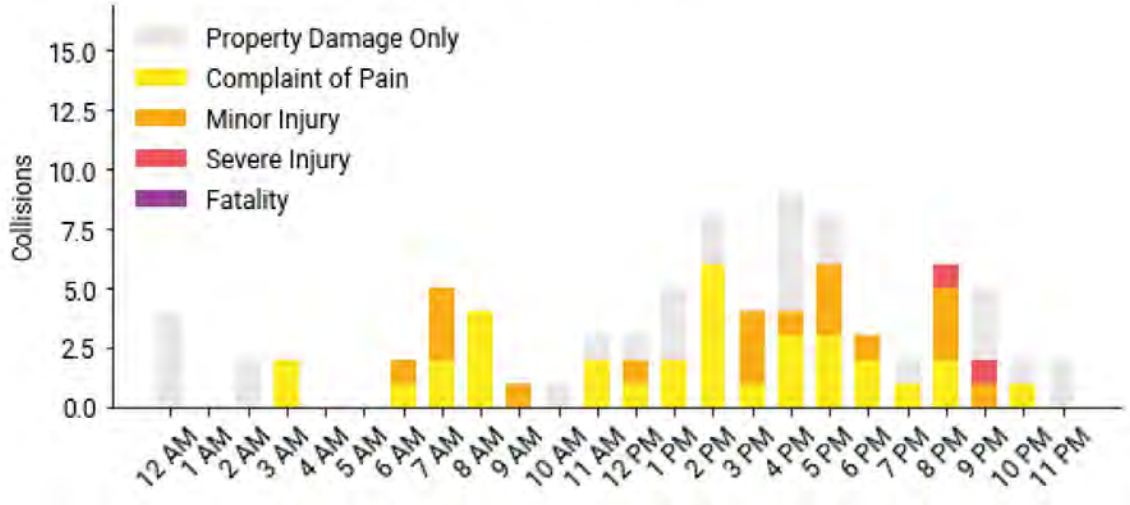


Figure 5. Map of Bicycle-Involved Collisions

SPEED DATA

The City collected vehicle speed data using pneumatic tubes at nine locations along the corridor across seven days (March 31 to April 6, 2023). Benton Street has a posted speed limit of 30 miles per hour (mph) from Lawrence Expressway to Maryann Drive. On average, 77.5% of drivers exceeded the speed limit on this section. Benton Street has a speed limit of 25 miles per hour from Maryann Drive to Lincoln Street. On average, 82.7% of drivers exceeded the speed limit on this section. Around 90% of people driving vehicles eastbound at Benton Street and Flora Vista Avenue exceeded the 30-mph speed limit during the study period. And as shown in **Table 5: Benton Street Speed Survey Results**, the 85th percentile speeds ranged from 33 to 41 mph, averaging around 37 mph. The 85th percentile speed is the speed at which 85% of the people driving on a road segment travel at or below. Based on this speed survey, the Study presents an opportunity to reduce vehicle speeds through thoughtful roadway design changes.

Table 5. Benton Street Speed Survey Results

Lawrence Expwy to Maryann Dr - Posted Speed Limit 30 MPH		
Speed Location (Eastbound)	**85th Percentile Speed (mph)**	**Percentage of People Driving > 30 mph**
Flora Vista Ave	41	90.0%
Pomeroy Ave	39	75.8%
Moraga St	39	74.3%
Buchanan Dr	38	71.9%
Eastbound Average	39	78.0%
Speed Location (Westbound)	**85th Percentile Speed (mph)**	**Percentage of People Driving > 30 mph**
Flora Vista Ave	39	84.1%
Pomeroy Ave	38	74.9%
Moraga St	38	72.9%
Buchanan Dr	37	76.0%
Westbound Average	36	77.0%
Corridor Average	**39**	**77.5%**
Maryann Dr to Lincoln St - Posted Speed Limit 25 MPH		
Speed Location (Eastbound)	**85th Percentile Speed (mph)**	**Percentage of People Driving > 30 mph**
Sunset Dr	34	86.6%
Pierce St	33	79.0%
Eastbound Average	34	82.8%
Speed Location (Westbound)	**85th Percentile Speed (mph)**	**Percentage of People Driving > 30 mph**
Sunset Dr	33	79.1%
Pierce St	33	86.0%
Westbound Average	33	82.6%
Corridor Average	**33**	**82.7%**

Parking Utilization

The project team conducted parking counts along both sides (westbound and eastbound) of Benton Street between Dunford Way and Lincoln Street on three consecutive weekdays (Tuesday through Thursday) on April 4, 5, and 6, and on Saturday, April 8, 2023. Counts were also collected on all side streets along Benton Street (500-foot segments) within the project area (i.e., 24 side streets). Staff conducted counts during three time periods per day:

- 7:00 to 9:00 a.m. to capture **peak daytime** parking needs,
- 11:00 a.m. to 2:00 p.m. to capture **peak midday** parking needs, and;
- 2:00 to 4:00 a.m. to capture **peak overnight** parking needs.

Available parking spaces were calculated by measuring the full length of the available frontage along the roadway and discounting the red curb frontage. Driveways were also counted and then subtracted (20 feet per driveway). This number was then divided by the average parallel parking spot length of 22 feet.

The project team studied the following side streets for 500 feet from Benton Street to the north and south:

- Waterbird Way
- Wood Duck Avenue
- Lawrence Expressway
- Flora Vista Avenue
- Curtis Avenue
- Capitola Way
- Julie Court
- Pomeroy Avenue
- Live Oak Drive
- Moraga Street
- Kiely Boulevard
- Sonoma Place
- White Drive
- Buchanan Drive
- Buchanan Court
- Loyola Court
- La Palmas Drive
- Blackfield Drive
- San Tomas Expressway
- Maryann Drive
- Los Padres Boulevard
- Block Drive
- Sunset Drive
- Blossom Drive
- Sunlite Drive
- Alice Drive
- Scott Boulevard
- Fairfield Avenue
- Inverness Avenue
- Chapel Drive
- Carmel Way
- Pierce Street

Benton Street accommodates 586 parking spaces along the study corridor and 1,216 parking spaces on side streets (500 feet along both sides from every Benton Street intersection). Utilization rates are calculated by the number of parking spaces used out of the full available inventory of legal spaces. Along the north side of Benton

Street, 93 out of 313 available parking spaces were used, which means there is a 30% utilization rate, leaving 70% of spaces available. Overall, the northern side of the corridor experienced higher utilization rates than the southern side, which experienced a utilization rate of 23%, where 77% of spaces were available. The average weekly parking utilization rates for the corridor generally fall below 30% and are slightly higher over the weekends. In terms of utilization along side streets, most side streets have availability between 50% and 85%, so their utilization rates fall between 15% and 50% with higher rates near the expressways, schools, apartments, and community centers. These availability rates are summarized in **Table 6** and **Table 7**.

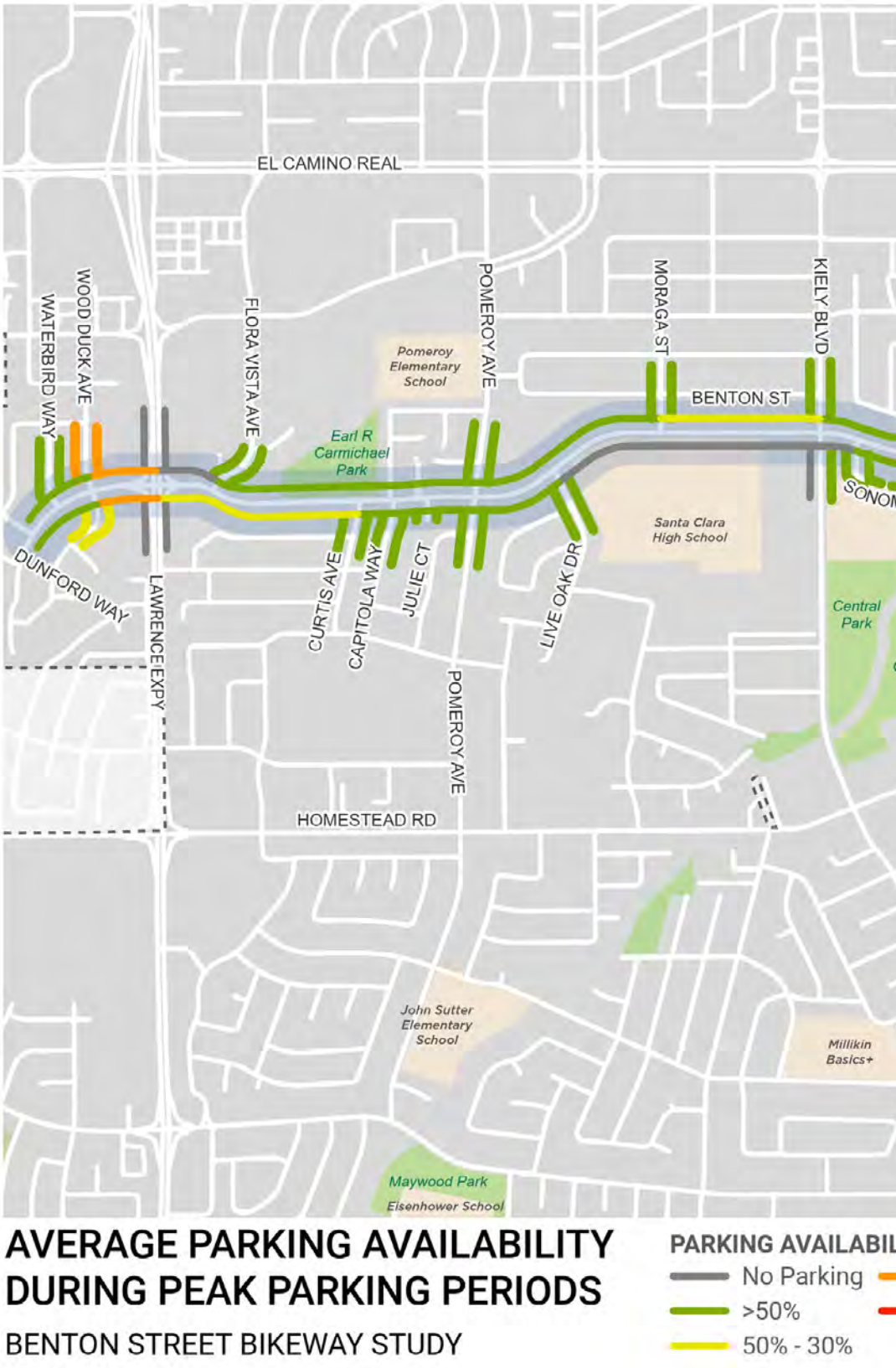
Table 6. Parking Availability Summary by Location

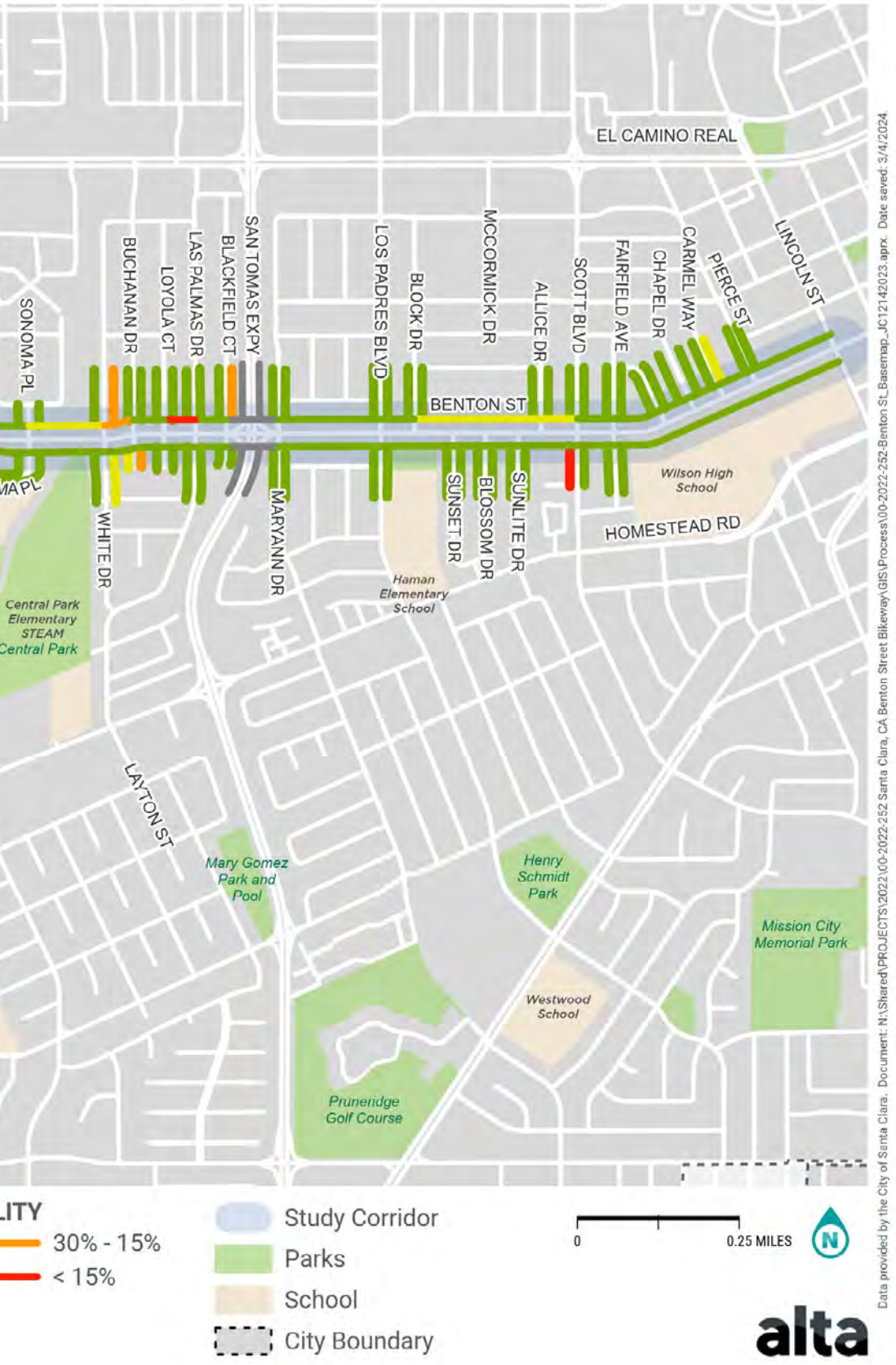
Location	Available Parking Spaces	Average Cars Observed	Parking Utilization Rate	Parking Availability
Benton Street - Overall	586	156	27%	**73%**
Benton Street - North Side	313	93	30%	**70%**
Benton Street - South Side	273	62	23%	**77%**
Side Streets	1,216	372	29%	**71%**

Table 7. Parking Average Availability by Day and Time

Parking Count Period	Benton Street Utilization	Benton Street Availability	Side Street Utilization	Side Street Availability
Weekday Morning, 7:00 - 9:00 a.m.	26%	**74%**	29%	**71%**
Weekday Midday, 11:00 a.m. - 2:00 p.m.	22%	**78%**	26%	**74%**
Weekday Overnight, 2:00 - 4:00 a.m.	28%	**72%**	33%	**67%**
Weekend Morning, 7:00 - 9:00 a.m.	29%	**71%**	32%	**68%**
Weekend Midday, 11:00 a.m. - 2:00 p.m.	26%	**74%**	30%	**70%**
Weekend Overnight, 2:00 - 4:00 a.m.	29%	**71%**	34%	**66%**

Figure 6. Current Average Parking Availability During Peak Periods

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LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
LOS PADRES BLVD
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MCCORMICK DR
ALLICE DR
SCOTT BLVD
FAIRFIELD AVE
CHAPEL DR
CARMEL WAY
PIERCE ST
LINCOLN ST
BENTON ST
WHITE DR
MARYANN DR
SUNSET DR
BLOSSOM DR
SUNLITE DR
Wilson High School
HOMESTEAD RD
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Central Park Elementary STEAM Central Park
LAYTON ST
Mary Gomez Park and Pool
Henry Schmidt Park
Mission City Memorial Park
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03.

Corridor Alternative Concepts and Analysis

Alternative Concepts

To meet the goals of the study, the project team developed three future visions or alternatives for the corridor for each of the two predominant widths. While each is technically feasible, they have unique benefits and trade-offs. The fourth alternative for each is to do nothing, also known as the "No Build" scenario. This chapter will describe each of the alternatives. The entire project corridor can be seen in **Figure 7**.

Existing Conditions/No Build

These roadway cross-sections, and following concepts, show prototypical locations on Benton Street to demonstrate different roadway and intersection design features. The concepts are not specific to a particular location or intersection on Benton Street. The cross-section design detail and more information on proposed dimensions and considerations of typical 64-foot, 38-foot, and 60-foot segments of Benton Street can be seen in **Figure 8** through **Figure 11**. The existing conditions are summarized below and represent a "No Build" scenario.

64-foot-wide typical section (Lawrence Expressway to San Tomas Expressway)

Benton Street from Lawrence Expressway to San Tomas Expressway generally has four traffic lanes and parking on both sides. The vehicle travel lanes are 11 to 12 feet wide; curb to curb width is 64 feet (including the gutter); and the public right-of-way is approximately 90 feet wide. This condition varies from Live Oak Drive to Sonoma Place near SCHS where there is a two-way left-turn lane, parking only along the north side of the street, and parking restricted along the south side of the street.

38-foot-wide typical section (Maryann Drive to Lincoln Street)

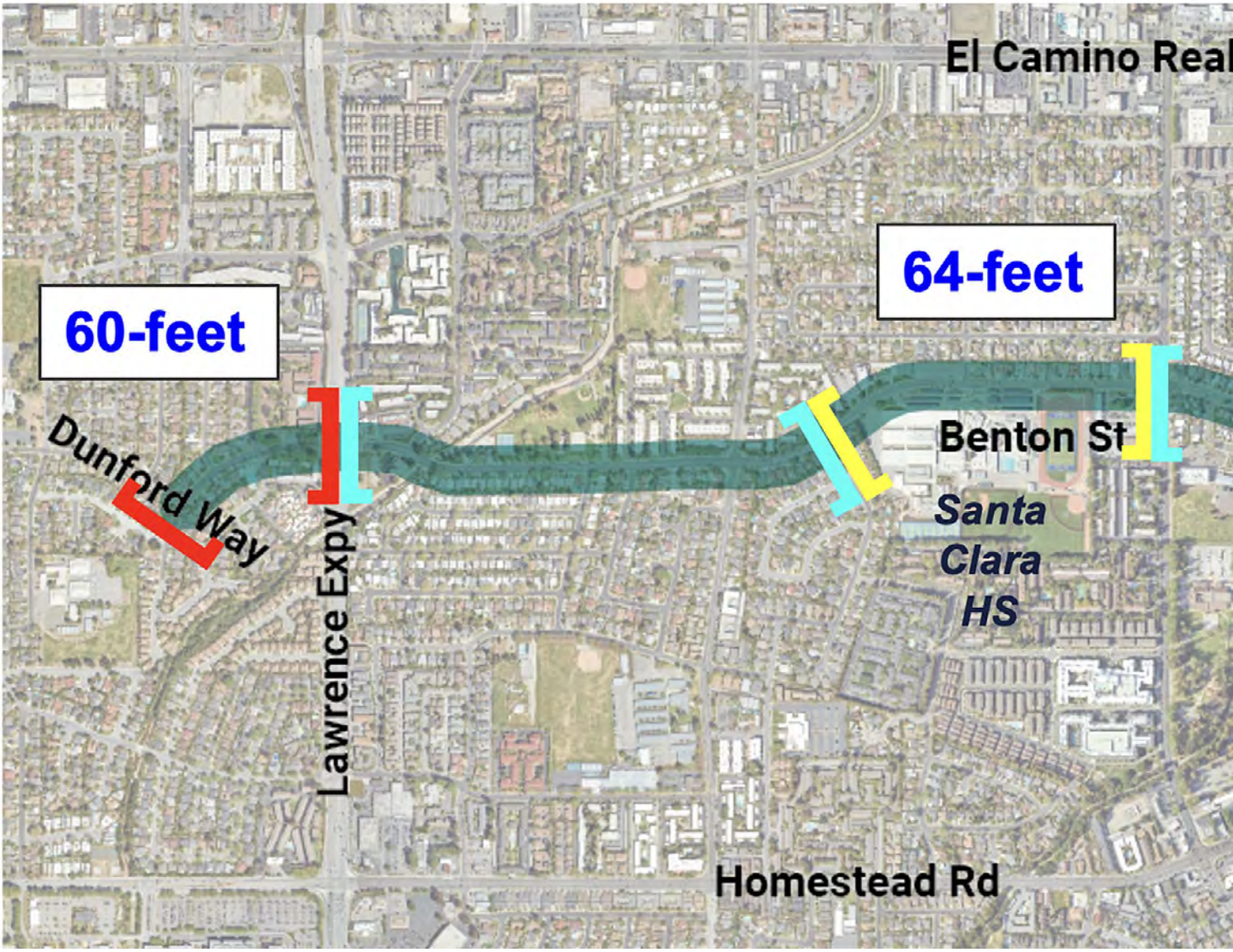
Benton Street from Maryann Drive to Lincoln Street has two travel lanes and parking on both sides. The vehicle travel lanes are 11 feet wide; curb to curb width is 38 feet (including the gutter); and the public right-of-way is 60 feet wide.

60-foot-wide typical section (Dunford Way to Lawrence Expressway)

Benton Street from Dunford Way to Lawrence Expressway has two traffic lanes and parking on both sides. The vehicle travel lanes are 20 feet wide; curb to curb width is 60 feet (including the gutter).

Some bicyclists were observed using the sidewalk due to no dedicated bicycle lanes (left). Bicyclists utilize the shoulder/parking lane when parked cars are not present, but this leads to the need to weave in and out of the vehicle travel lane (right).

Figure 7. Project Overview Map



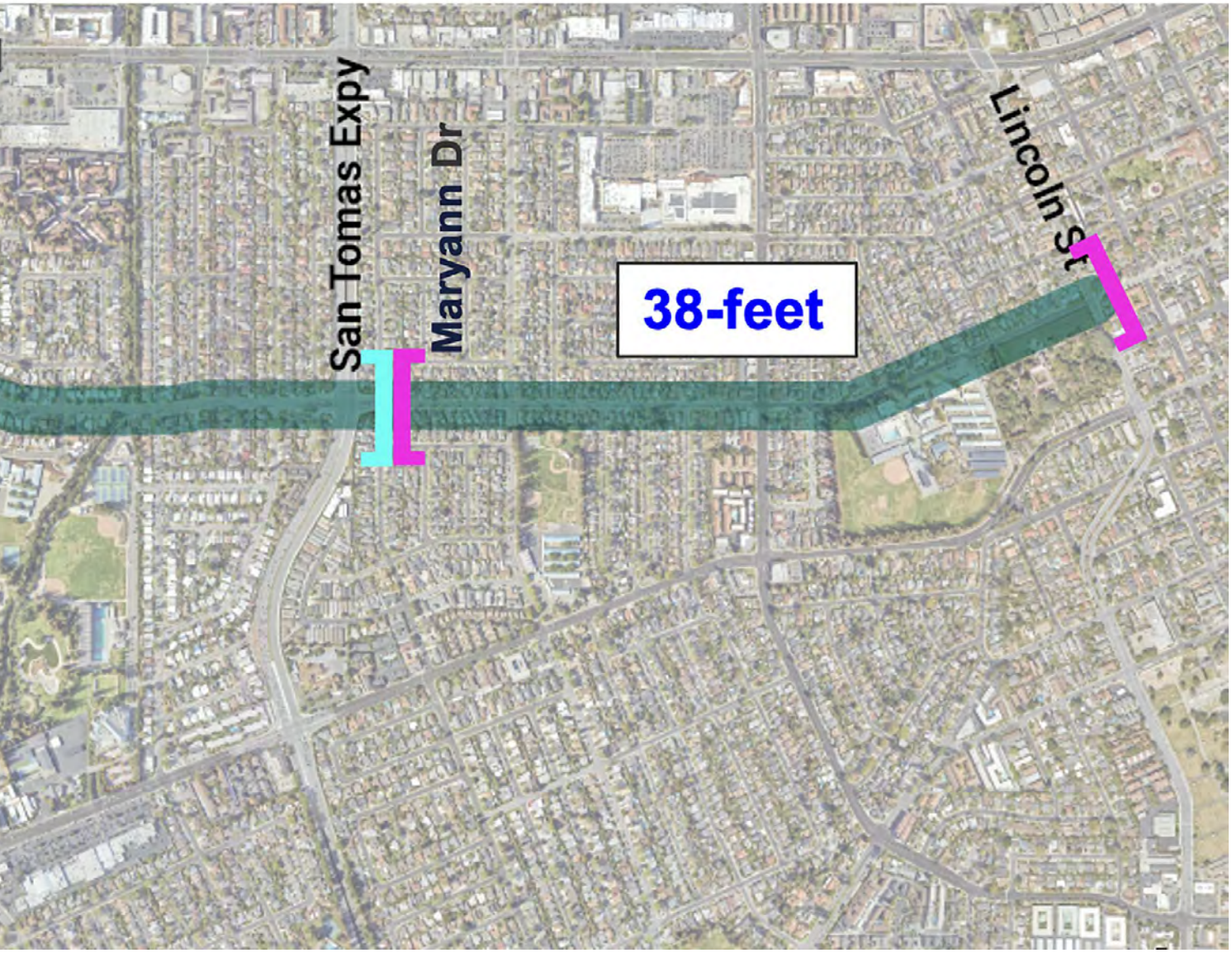
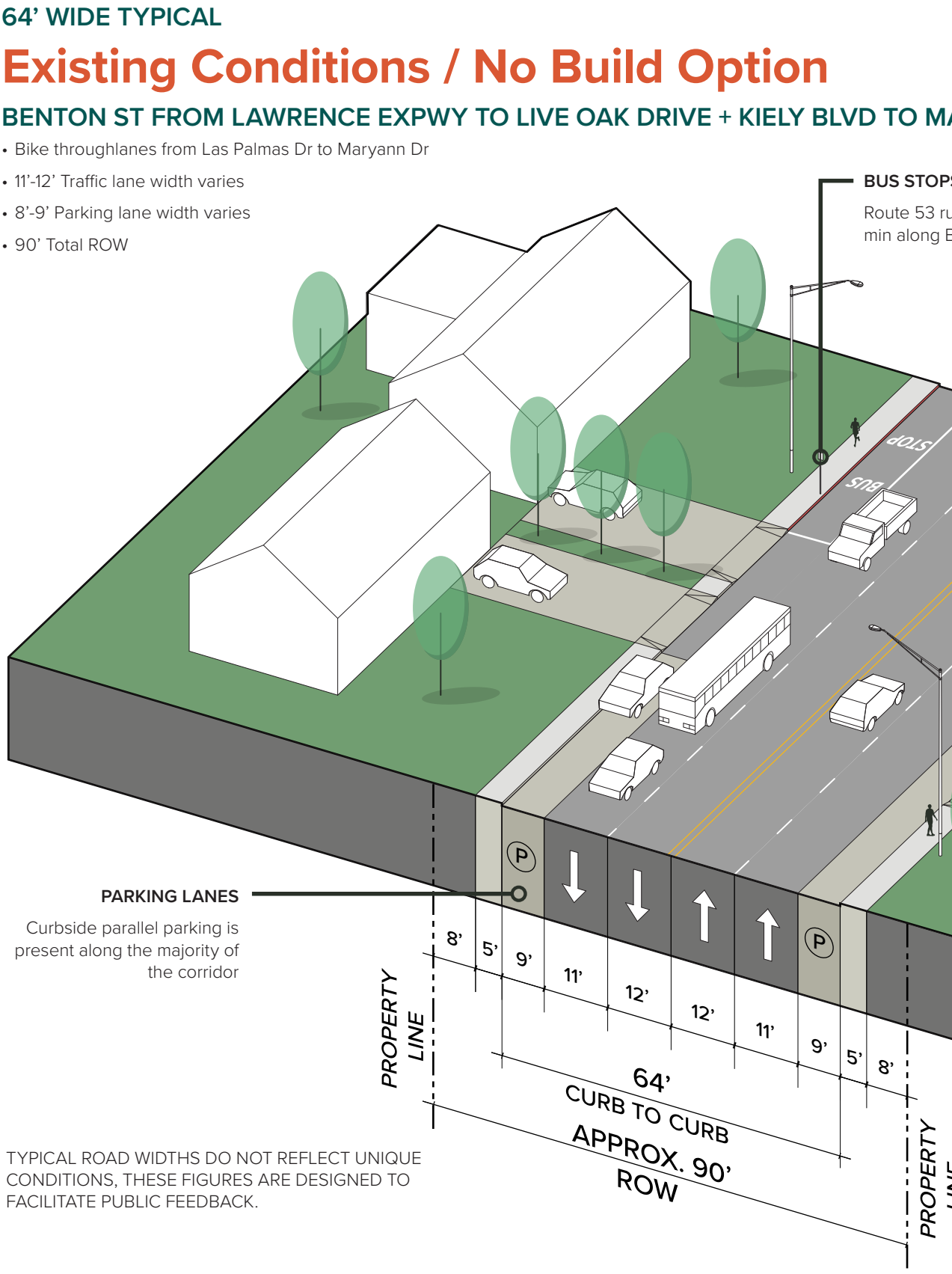

San Tomas Expy
Maryann Dr
38-feet
Lincoln St

Figure 8. Existing Conditions/No Build Cross-Section – 64-Foot Segment



ARYANN DR

S

uns every 30
Benton

CHALLENGING VISIBILITY

Driveway entry and exit is challenging due to fast-moving vehicles and curbside parking

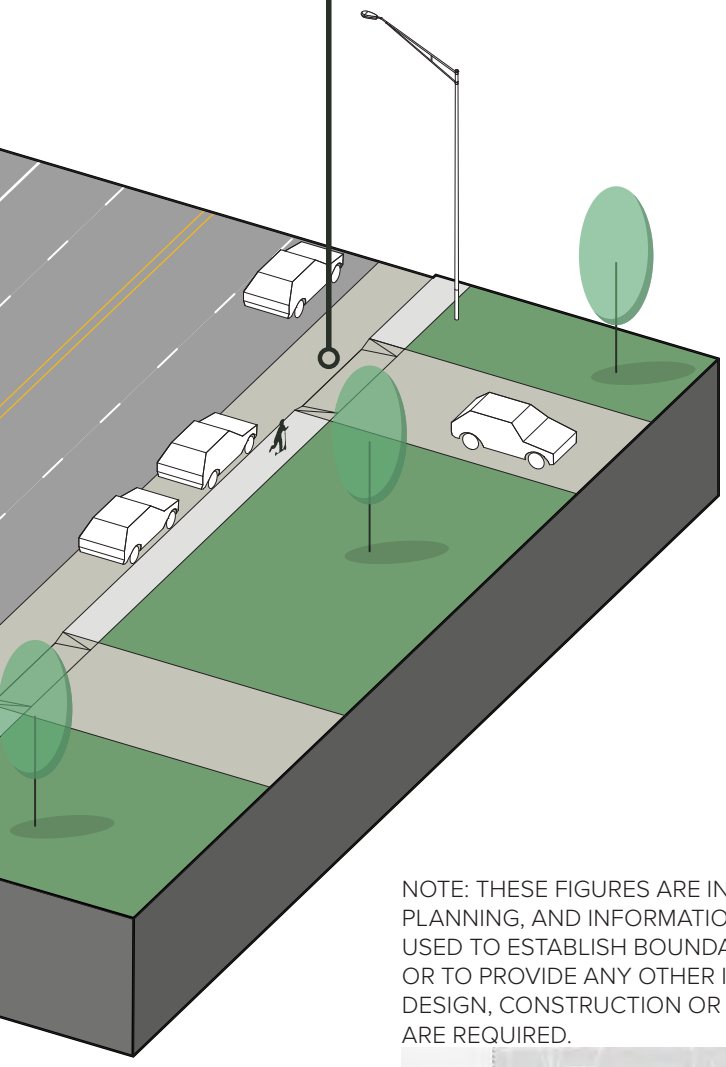


PHOTO: EXISTING CONDITIONS ON BENTON

NOTE: THESE FIGURES ARE INTENDED ONLY FOR REFERENCE, CONCEPTUAL PLANNING, AND INFORMATIONAL PURPOSES. THESE FIGURES SHOULD NOT BE USED TO ESTABLISH BOUNDARIES, PROPERTY LINES, LOCATION OF OBJECTS, OR TO PROVIDE ANY OTHER INFORMATION TYPICALLY NEEDED FOR FINAL DESIGN, CONSTRUCTION OR ANY OTHER PURPOSE WHEN ENGINEERED PLANS ARE REQUIRED.

LINE

Figure 9. Existing Conditions/No Build Section – 64-Foot Segment by Santa Clara High School

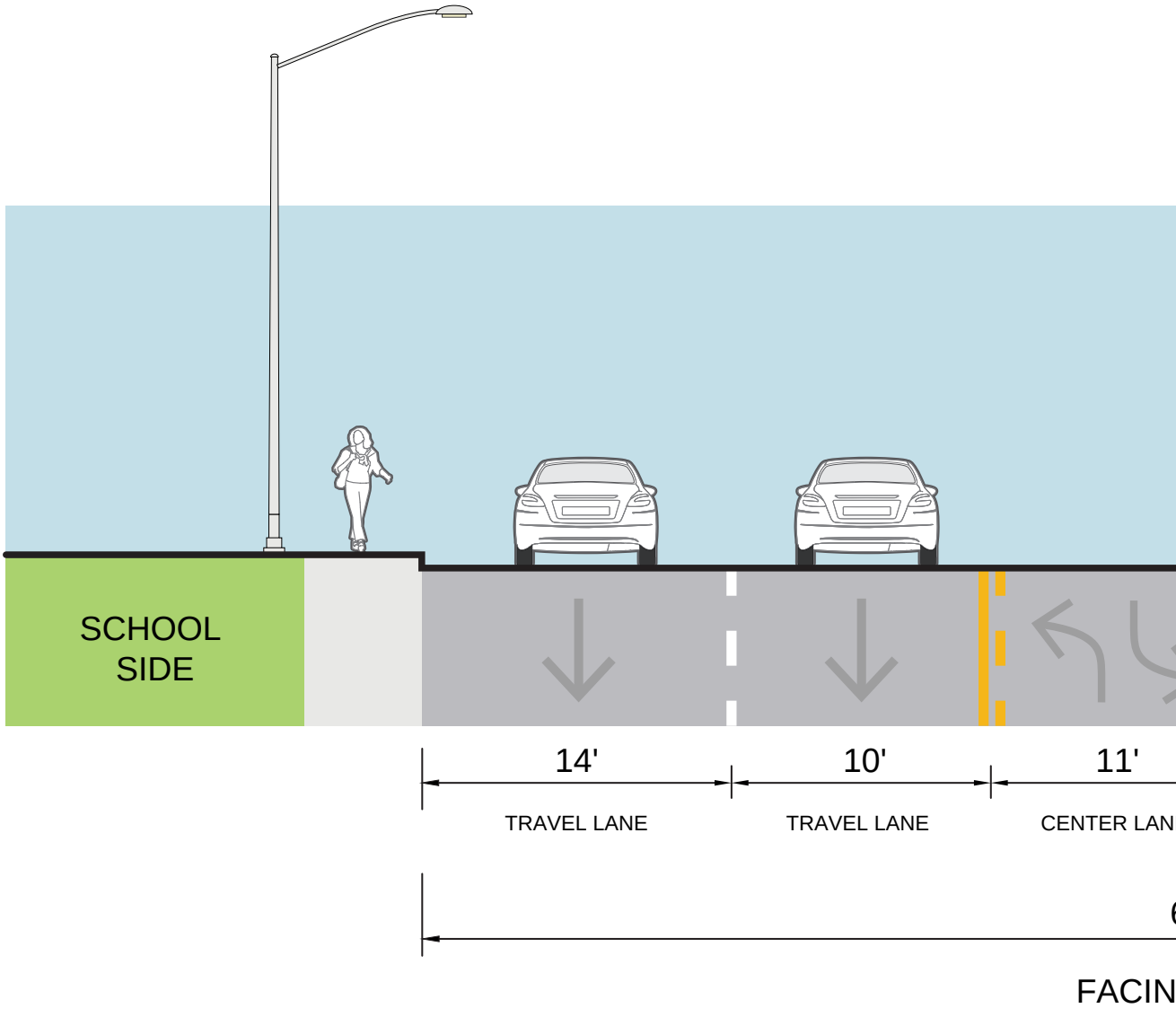
64' WIDE

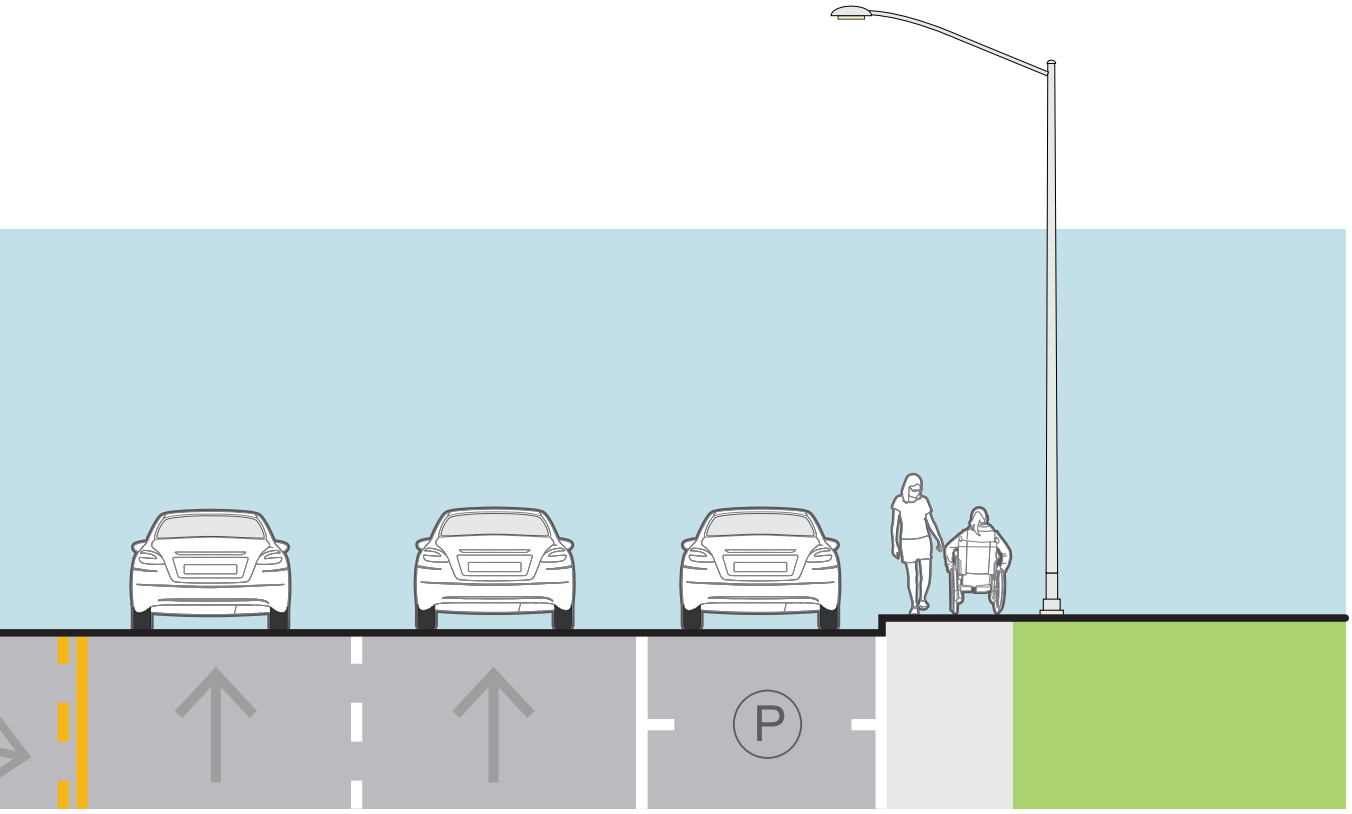
Existing Conditions / No Build Option

ALONGSIDE HIGH SCHOOL

BENTON ST FROM LIVE OAK DR TO KIELY BLVD

- One side parking + center lane





64'

G WEST

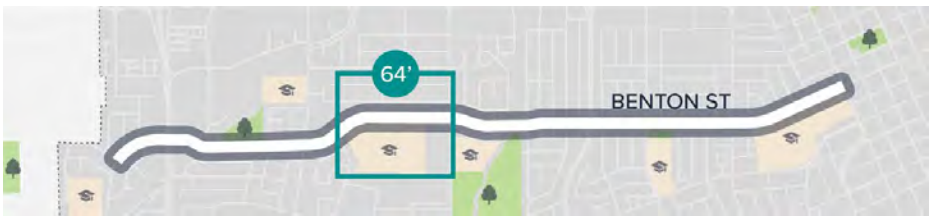


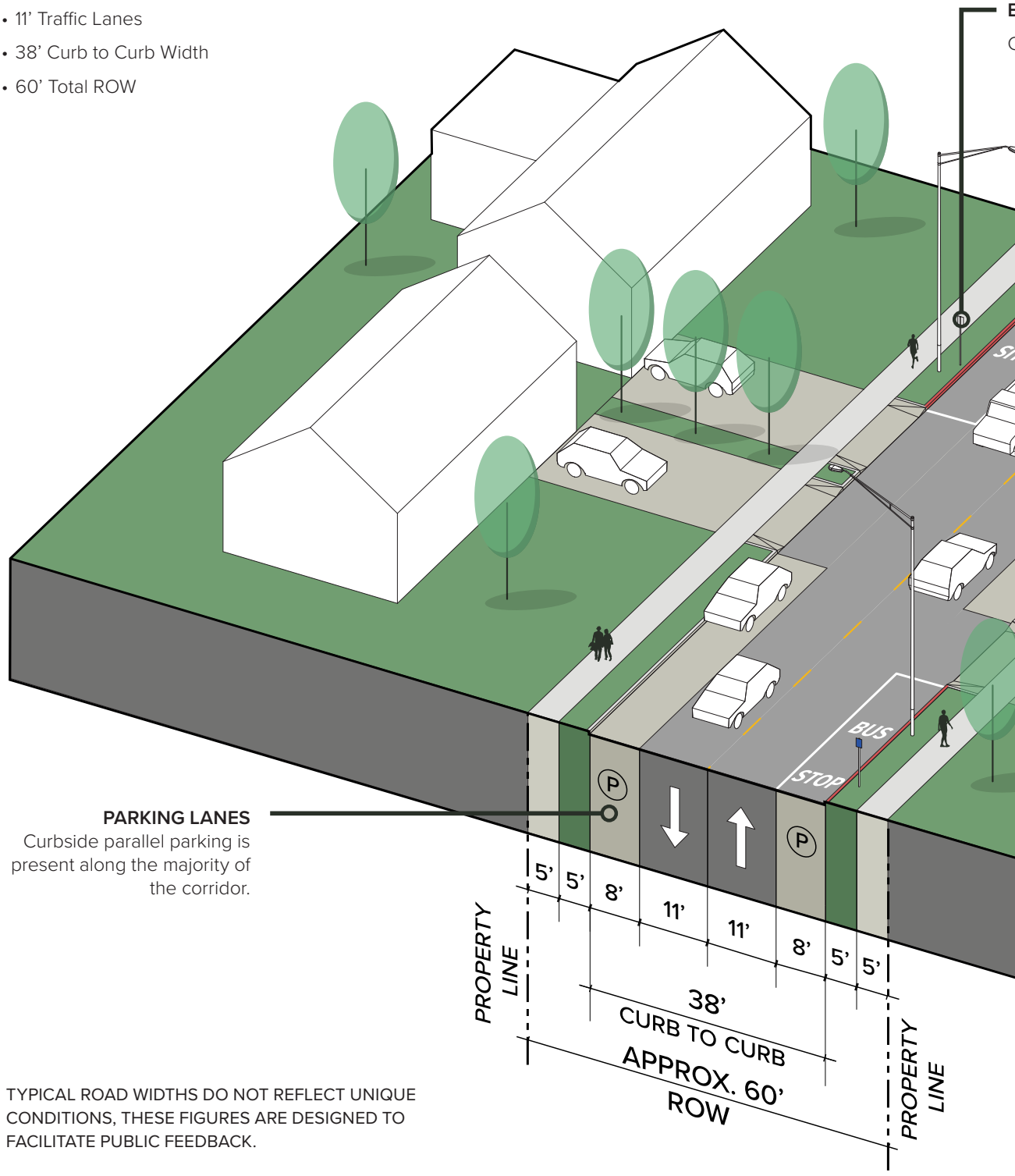
Figure 10. Existing Conditions/No Build Cross-Section – 38-Foot Segment

38’ WIDE TYPICAL

Existing Conditions / No Build Option

BENTON ST FROM MARYANN DR TO LINCOLN ST

- 11’ Traffic Lanes
- 38’ Curb to Curb Width
- 60’ Total ROW



PARKING LANES
Curbside parallel parking is present along the majority of the corridor.

TYPICAL ROAD WIDTHS DO NOT REFLECT UNIQUE CONDITIONS, THESE FIGURES ARE DESIGNED TO FACILITATE PUBLIC FEEDBACK.

BUS STOPS

Curbside pick up

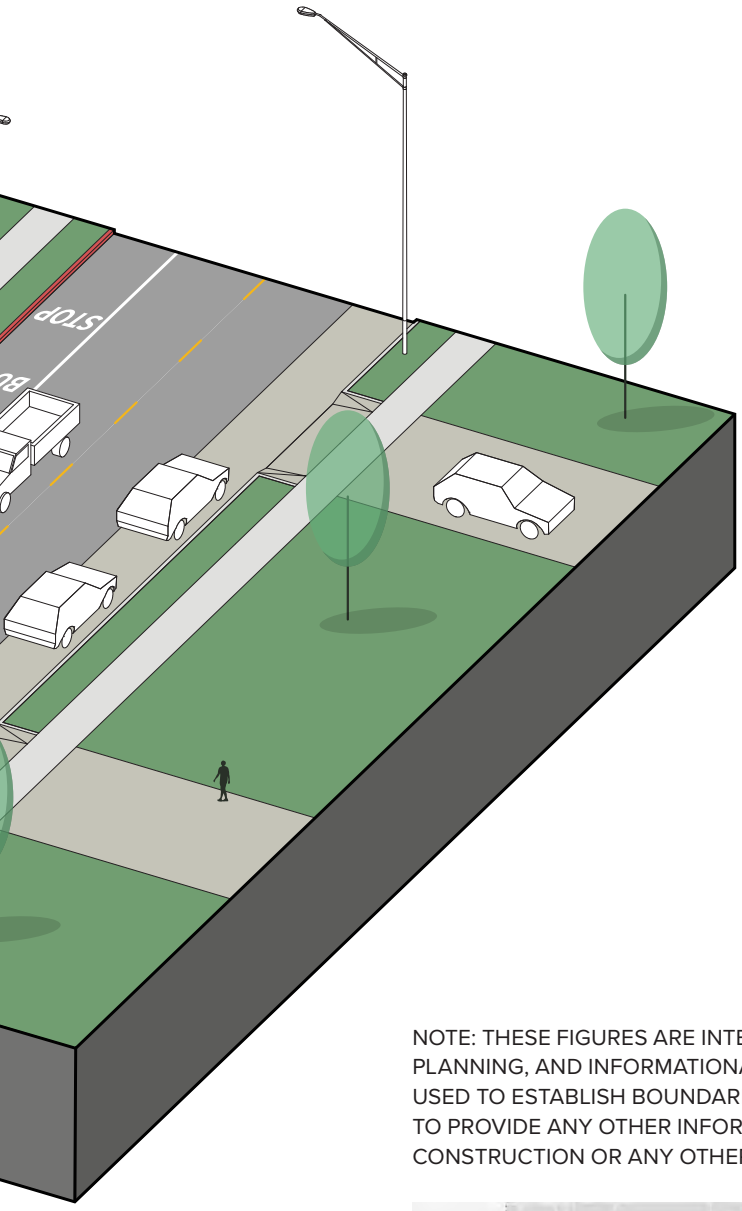
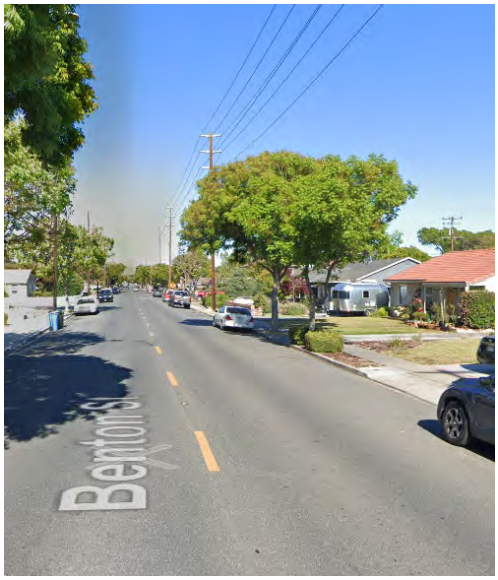


PHOTO: EXISTING CONDITIONS ON BENTON



NOTE: THESE FIGURES ARE INTENDED ONLY FOR REFERENCE, CONCEPTUAL PLANNING, AND INFORMATIONAL PURPOSES. THESE FIGURES SHOULD NOT BE USED TO ESTABLISH BOUNDARIES, PROPERTY LINES, LOCATION OF OBJECTS, OR TO PROVIDE ANY OTHER INFORMATION TYPICALLY NEEDED FOR FINAL DESIGN, CONSTRUCTION OR ANY OTHER PURPOSE WHEN ENGINEERED PLANS ARE REQUIRED.

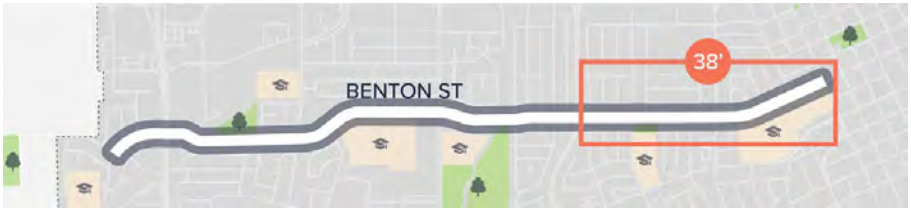


Figure 11. Existing Conditions/No Build Section – 60-Foot Segment

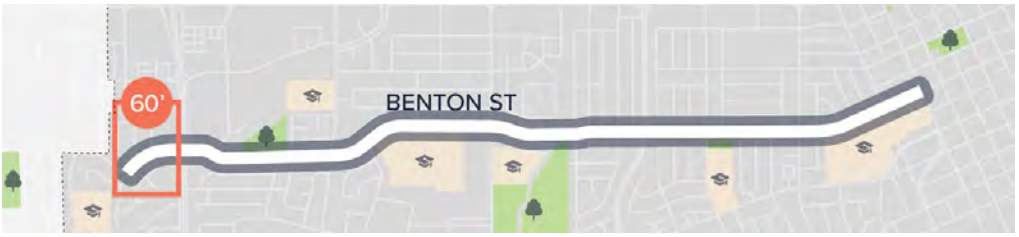
60’ WIDE

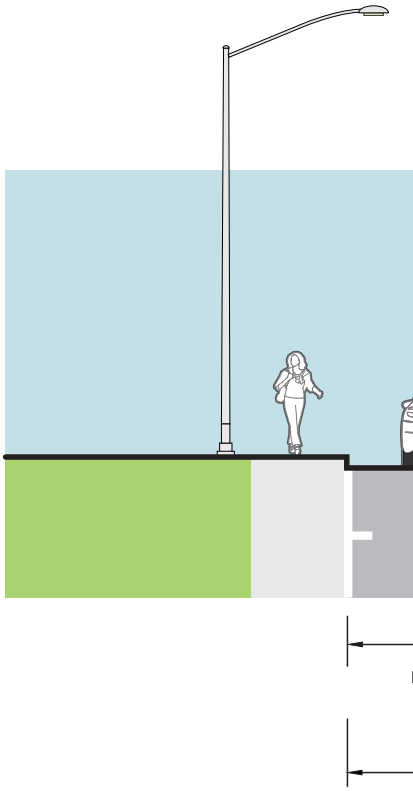
Existing Conditions / No Build

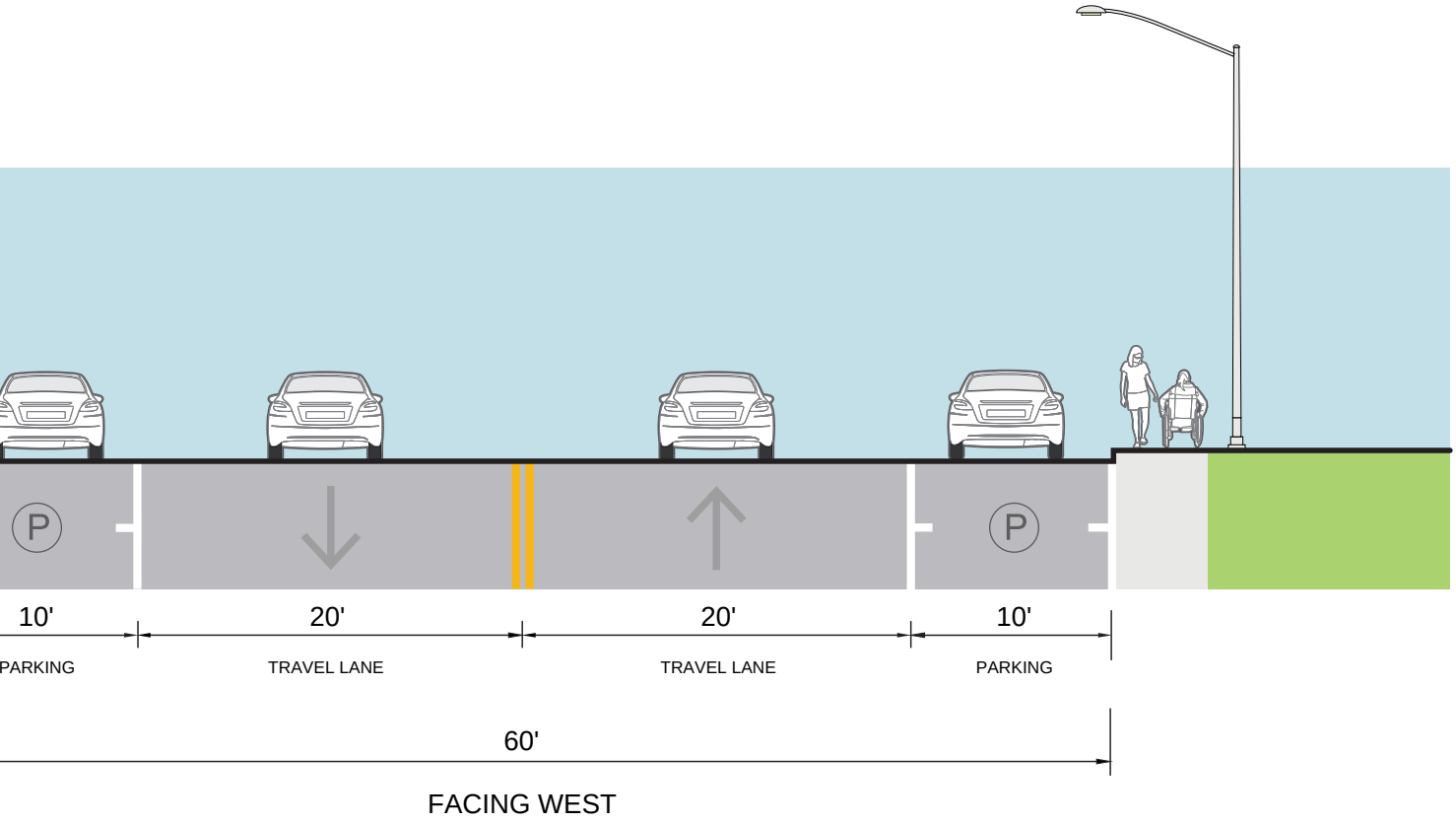
VARIATION FROM TYPICAL EXISTING CONDITION

BENTON ST FROM DUNFORD WAY TO LAWRENCE EXPWY

- Wide travel lanes






P
P
10'
20'
20'
10'
PARKING
TRAVEL LANE
TRAVEL LANE
PARKING
60'
FACING WEST

Corridor Design Concepts – 64-Foot Width

Concept A: Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides

From Lawrence Expressway to Live Oak Drive and from Kiely Boulevard to Maryann Drive, this concept removes one travel lane in each direction and adds a two-way center left-turn lane. Parking is maintained on both sides of the street. An eight-foot-wide buffered bicycle lane (Class IIB) is added to each side of the street, with five feet of bikeway and three feet of buffer.

From Live Oak Drive to Kiely Boulevard, alongside SCHS, this concept removes one travel lane in each direction and keeps the two-way left-turn lane. This concept provides additional protection for cyclists arriving at the high school or traveling through the area. The parking on the north side of the street is maintained. A nine-foot-wide buffered bike lane is added to the north side of the street and an 11-foot-wide separated bikeway (Class IV) is added to the south side of the street (school side). The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 12** (for typical 64-foot-wide section) and **Figure 13** (alongside Santa Clara High School).

Concept B: Two Lanes, Center Turn Lane, Parking-Separated Bikeway

From Lawrence Expressway to Live Oak Drive and from Kiely Boulevard to Maryann Drive, this concept removes one travel lane in each direction and adds a two-way center left-turn lane. An eight-foot-wide parking-separated bikeway is added to each side of the street, with five feet of bikeway and three feet of buffer. Parking is maintained on both sides of the street but is positioned outside the bikeway to act as vertical separation between the bikeway and vehicle travel lane.

From Live Oak Drive to Kiely Boulevard, alongside SCHS, this concept removes one travel lane in each direction and keeps the two-way left-turn lane. This concept provides additional protection for cyclists arriving at the high school or traveling through the area. The parking on the north side of the street is moved outside a nine-foot-wide buffered bike lane. An 11-foot-wide separated bikeway (Class IV) is added to the south side of the street (school side). The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 14** (for typical 64-foot-wide section) and **Figure 15** (alongside Santa Clara High School).

Concept C: Four Lanes, Buffered Bike Lanes, Remove Parking on One Side

From Lawrence Expressway to Live Oak Drive and from Kiely Boulevard to Maryann Drive, this concept maintains four travel lanes but removes one parking lane. Parking will be removed from the south side, as that would have the least impact on parking supply on the Benton Street 64-foot-wide section. A seven-foot-wide buffered bicycle lane (Class IIB) is added to each side of the street, with five feet of bikeway and two feet of buffer.

From Live Oak Drive to Kiely Boulevard, alongside SCHS, this concept keeps four travel lanes and the two-way left-turn lane. On the north side of the street, parking is removed, and a five-foot-wide bike lane is added. An eight-foot-wide separated bikeway (Class IV) is added to the south side of the street (school side). The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 16** (for typical 64-foot-wide section) and **Figure 17** (alongside Santa Clara High School).

Figure 12. Concept A: Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides for Benton Street 64-Foot-Wide Typical Section

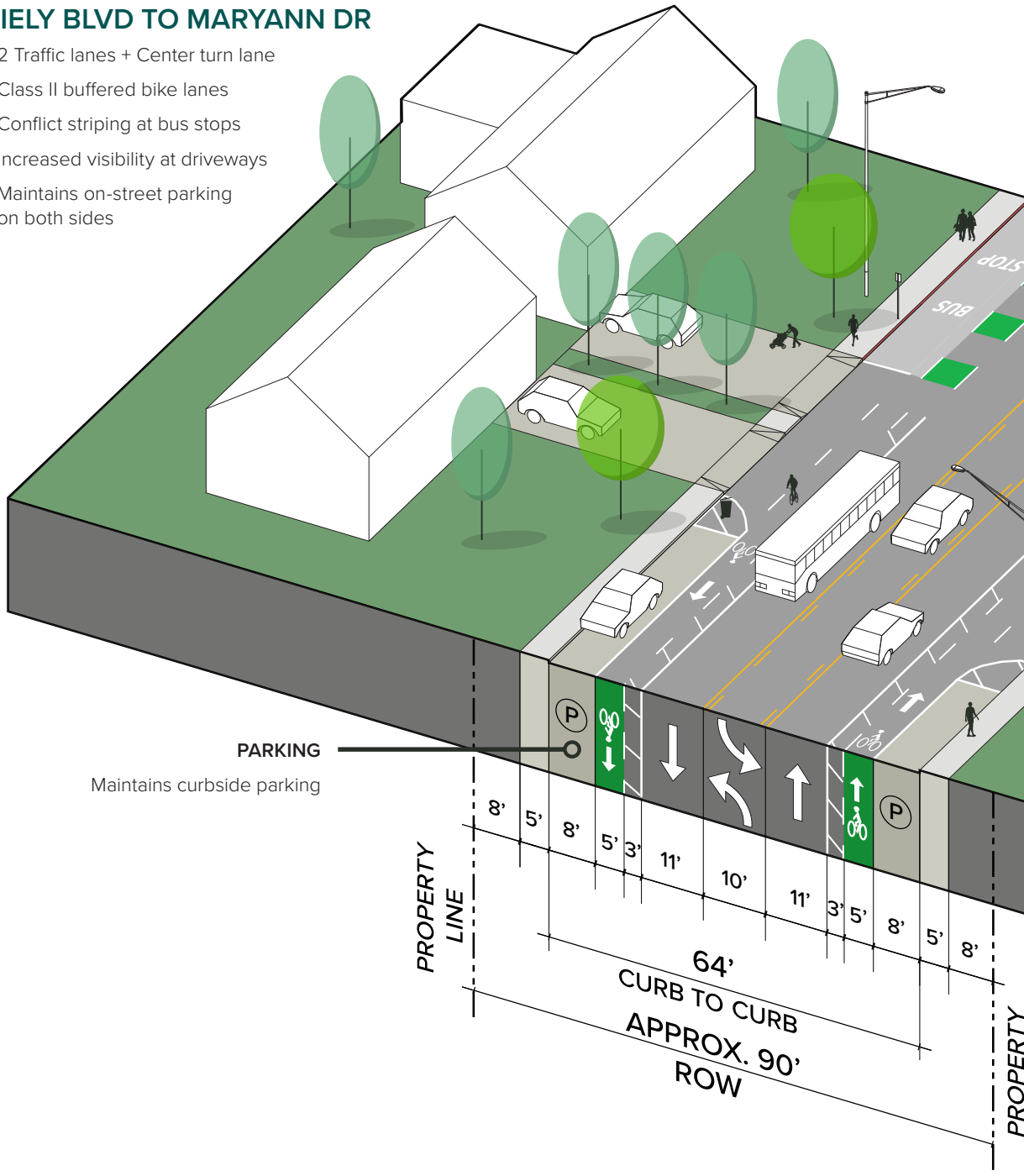
64’ WIDE TYPICAL

Concept A

TWO LANES, CENTER TURN LANE, BUFFERED BIKE LANES, PARKING ON BOTH SIDES

BENTON ST FROM LAWRENCE EXPWY TO LIVE OAK DRIVE + KIELY BLVD TO MARYANN DR

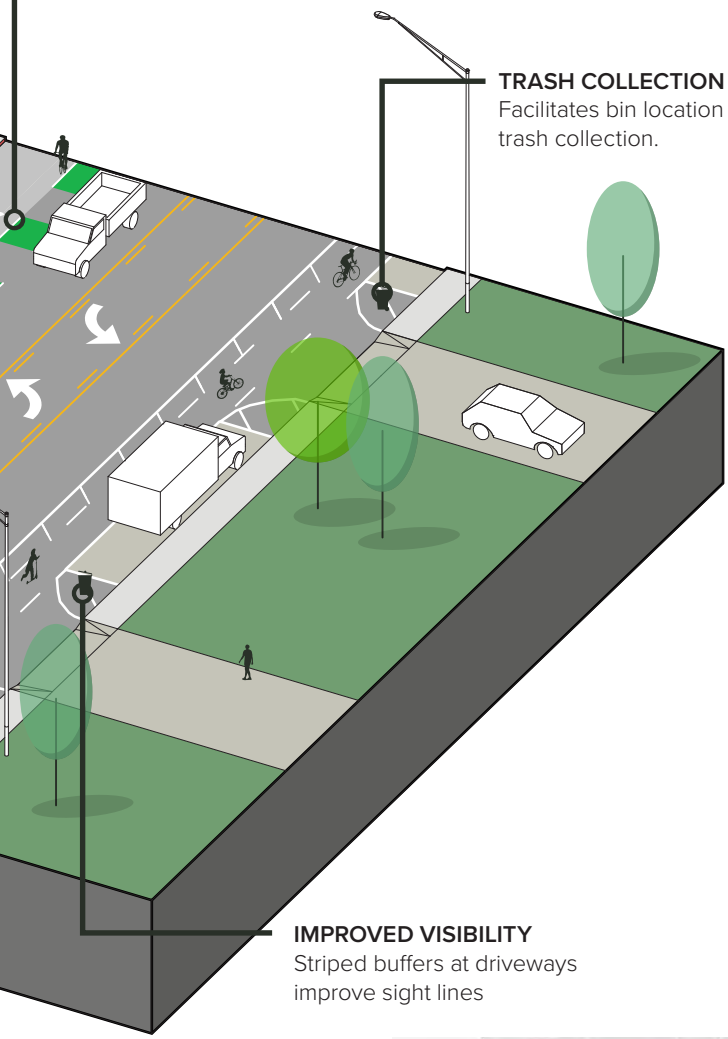
- 2 Traffic lanes + Center turn lane
- Class II buffered bike lanes
- Conflict striping at bus stops
- Increased visibility at driveways
- Maintains on-street parking on both sides



BUS MIXING ZONE
Green striping helps warn users of potential conflict between buses and cyclists.

Buffer area maintains consistent vehicle lane width.

TRASH COLLECTION
Facilitates bin location for trash collection.



IMPROVED VISIBILITY
Striped buffers at driveways improve sight lines

BUFFERED BIKE LANES
A buffer between vehicle traffic provides additional horizontal separation from vehicles.

LINE

Figure 13. Concept A: Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides for Benton Street 64-Foot-Wide Typical Section – Alongside Santa Clara High School

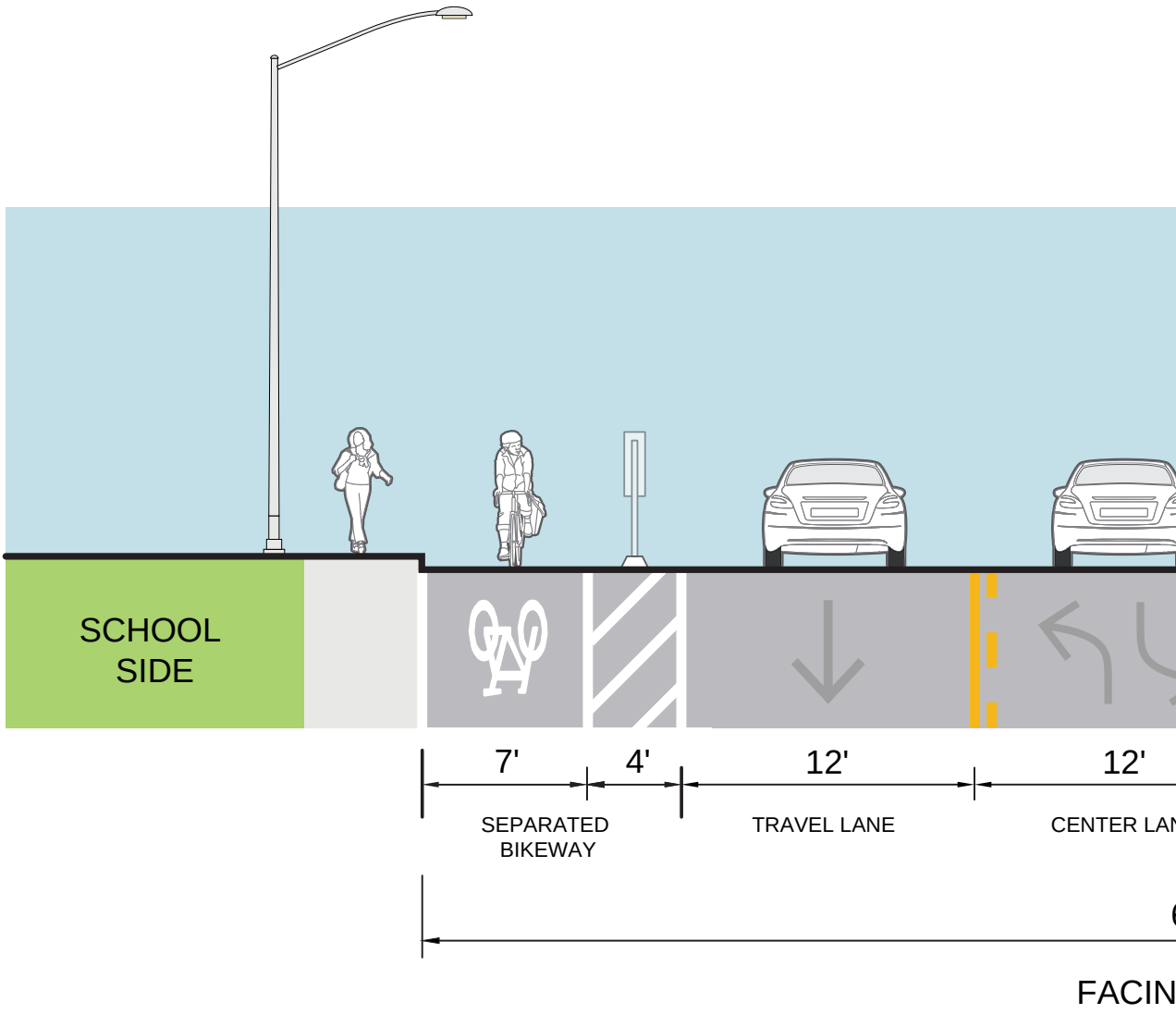
64’ WIDE

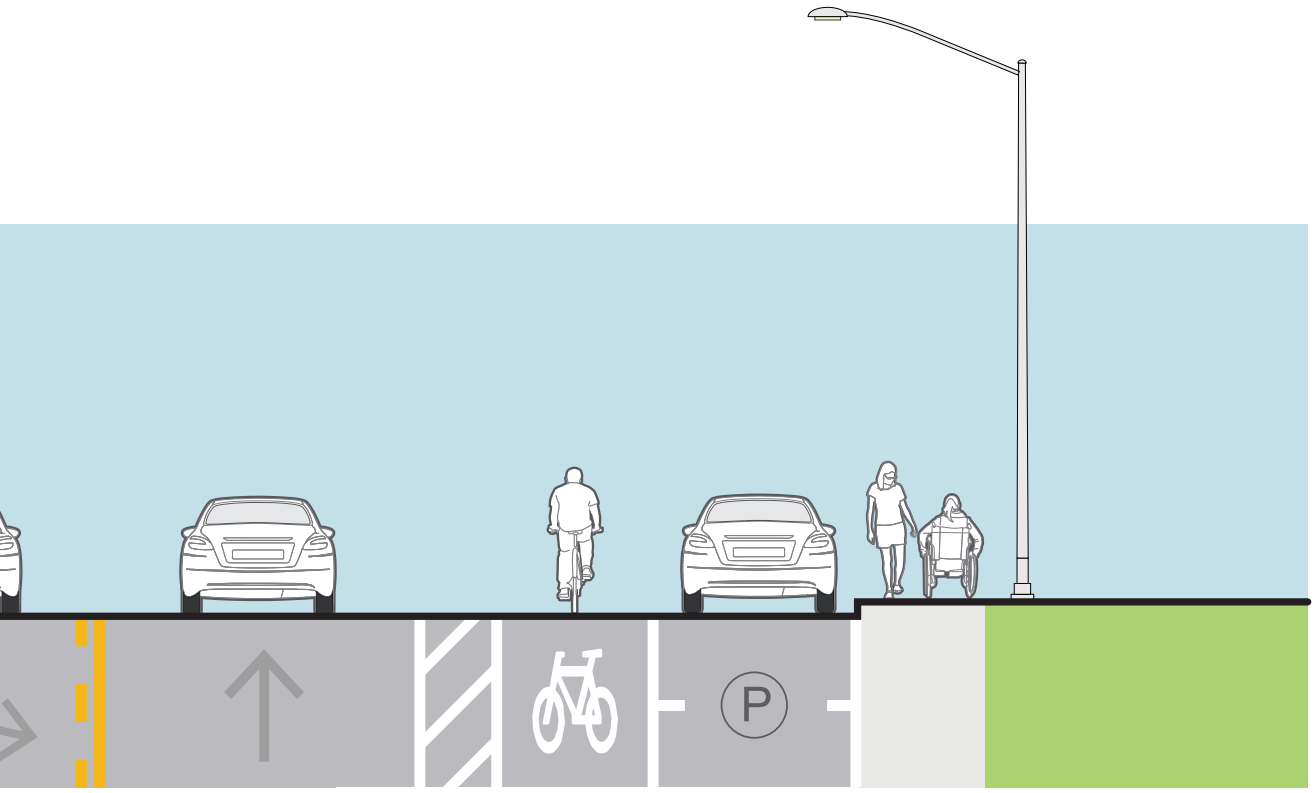
Concept A

ALONGSIDE HIGH SCHOOL

BENTON ST FROM LIVE OAK DR TO KIELY BLVD

- South side protected bike lane - in front of high school
- North side buffered bike lane - in front of residences





12' 3' 6' 8'

NE TRAVEL LANE BUFFERED BIKE LANE PARKING

64'

G WEST

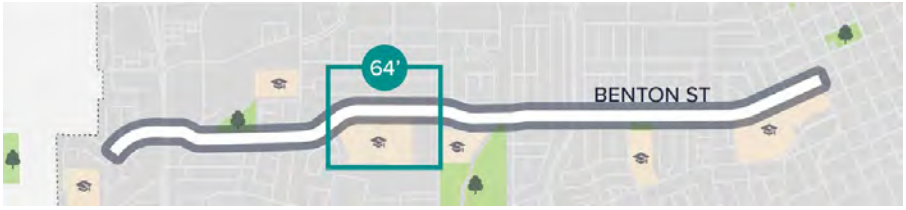


Figure 14. Concept B: Two Lanes, Center Turn Lane, Parking-Separated Bikeway for Benton Street 64-Foot-Wide Typical Section

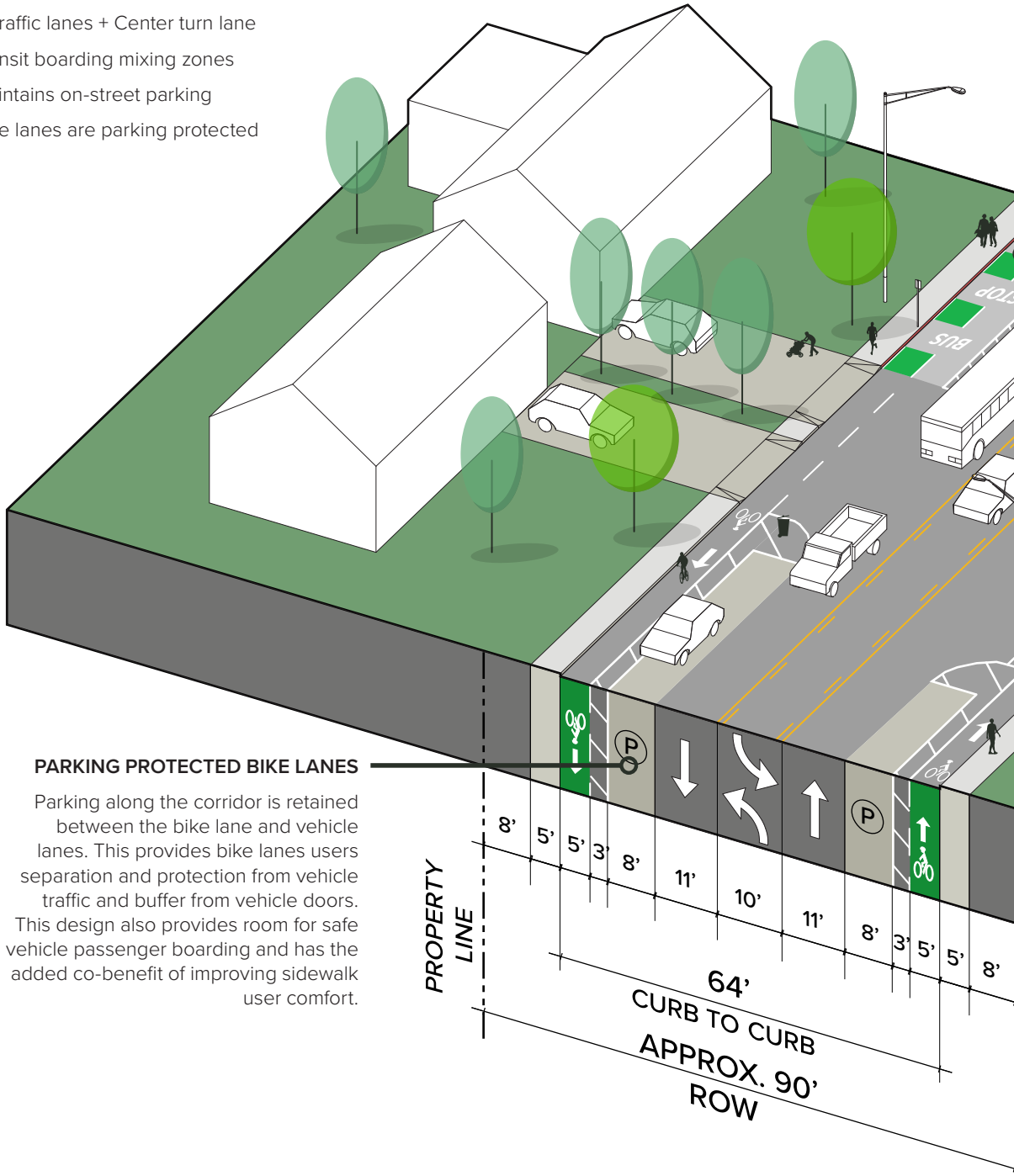
64’ WIDE TYPICAL

Concept B

TWO LANES, CENTER TURN LANE, PARKING-PROTECTED BIKE LANES

BENTON ST FROM LAWRENCE EXPWY TO LIVE OAK DRIVE + KIELY BLVD TO MARYANN DR

- 2 Traffic lanes + Center turn lane
- Transit boarding mixing zones
- Maintains on-street parking
- Bike lanes are parking protected



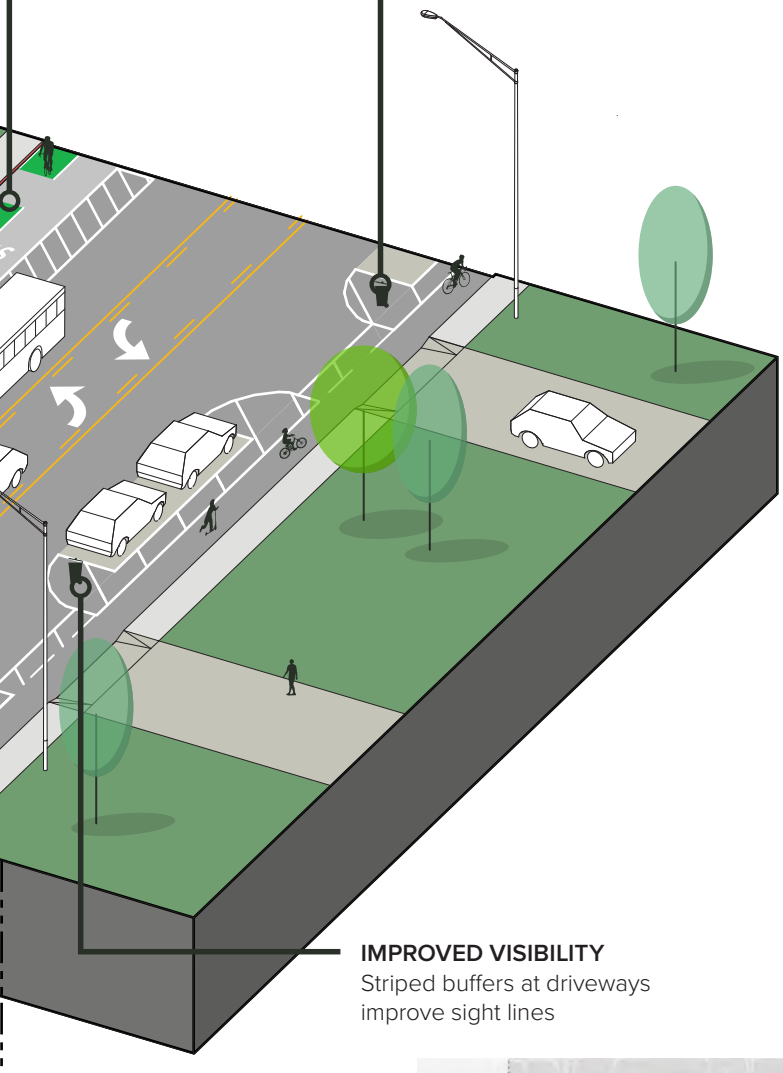
PARKING PROTECTED BIKE LANES

Parking along the corridor is retained between the bike lane and vehicle lanes. This provides bike lanes users separation and protection from vehicle traffic and buffer from vehicle doors. This design also provides room for safe vehicle passenger boarding and has the added co-benefit of improving sidewalk user comfort.

BUS MIXING ZONE
Green striping helps warn users of potential conflict between buses and cyclists.

Buffer area maintains consistent vehicle lane width.

TRASH COLLECTION
Facilitates bin location for trash collection.



IMPROVED VISIBILITY
Striped buffers at driveways improve sight lines

PROPERTY LINE

EXAMPLE OF PARKING PROTECTED BIKE LANES

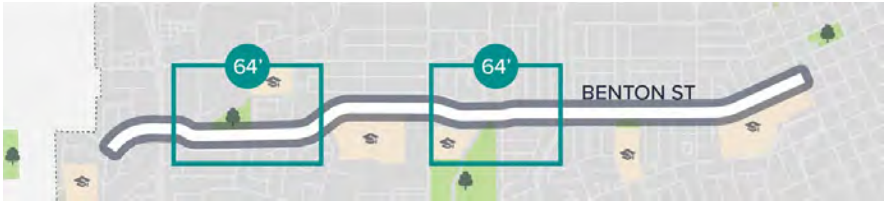


Figure 15. Concept B: Two Lanes, Center Turn Lane, Parking-Separated Bikeway for Benton Street 64-Foot-Wide Typical Section – Alongside Santa Clara High School

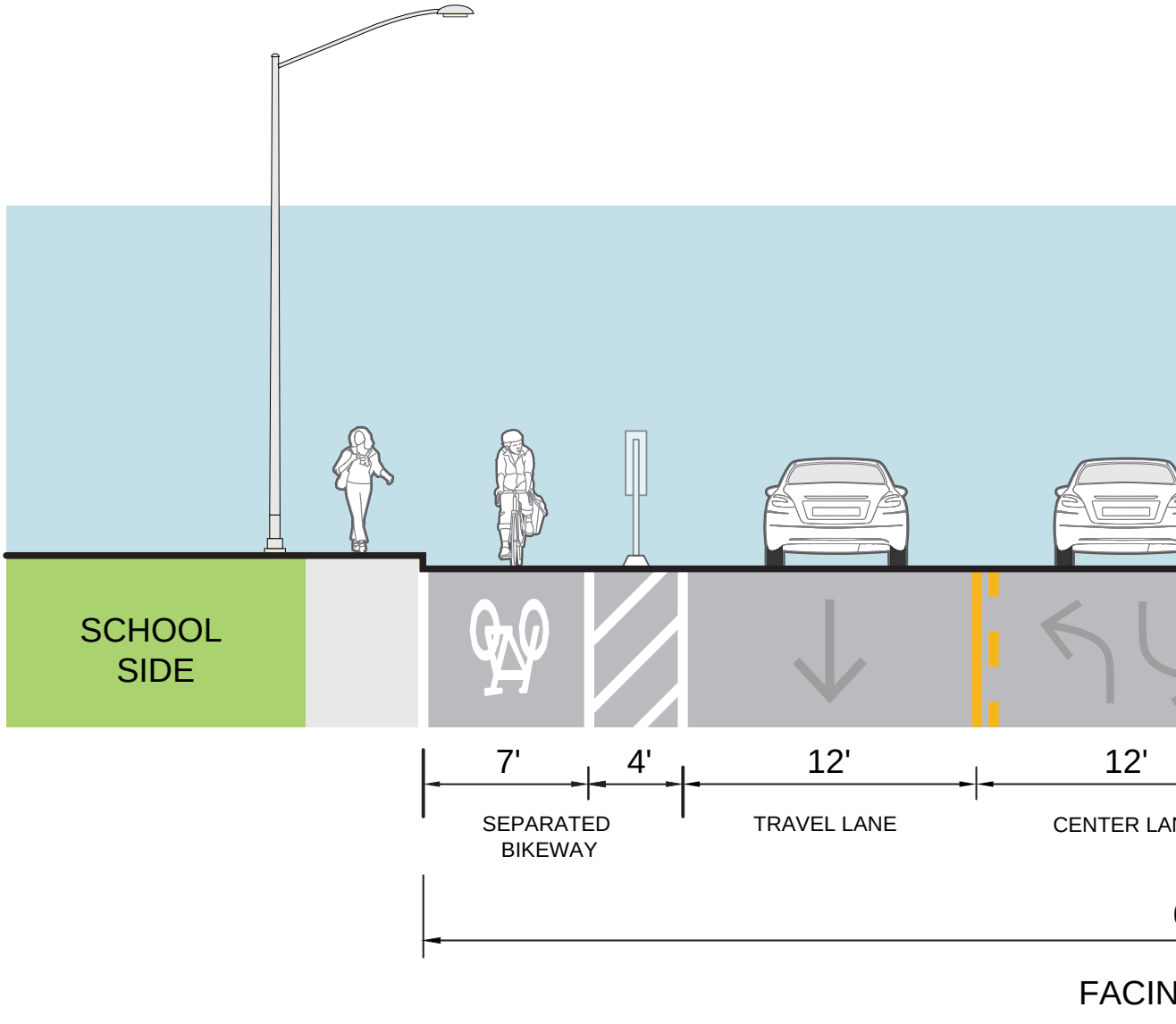
64’ WIDE

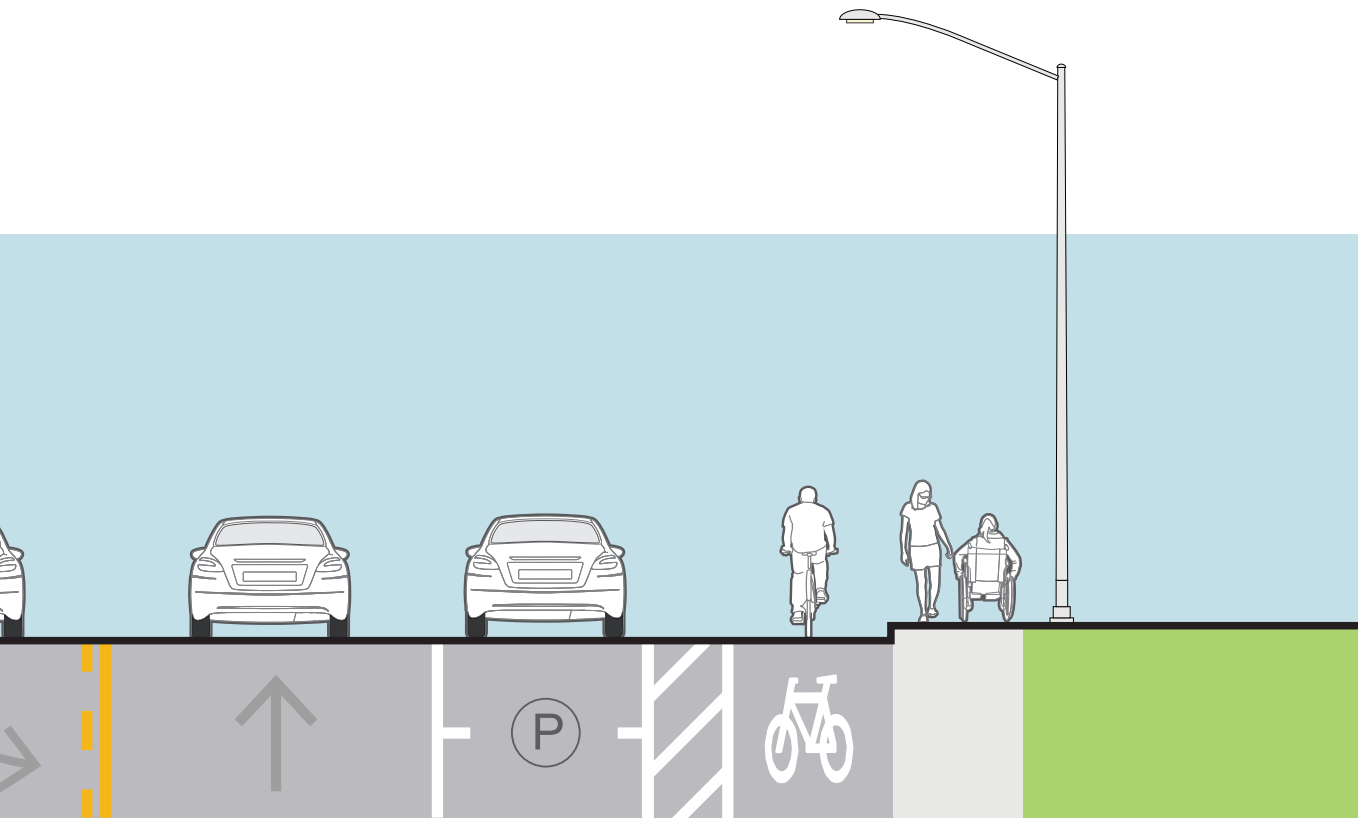
Concept B

ALONGSIDE HIGH SCHOOL

BENTON ST FROM LIVE OAK DR TO KIELY BLVD

- South side protected bike lane - in front of high school
- North side parking-protected bike lane - in front of residences




P
12'
8'
3'
6'
NE
TRAVEL LANE
PARKING
SEPARATED
BIKEWAY
64'

NG WEST


64'
BENTON ST

Figure 16. Concept C: Four Lanes, Buffered Bike Lanes, Remove Parking on One Side for Benton Street 64-Foot-Wide Typical Section

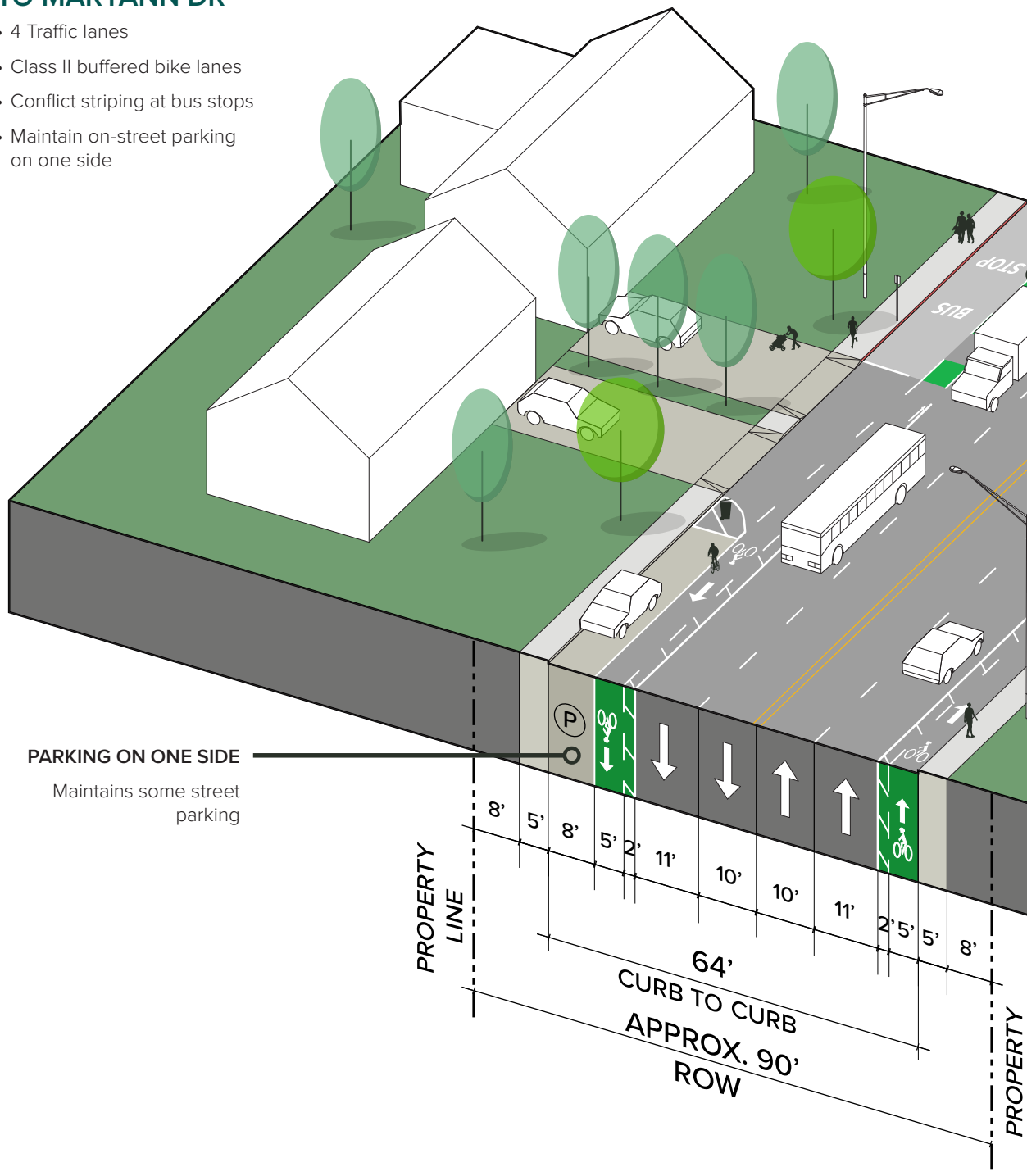
64’ WIDE TYPICAL

Concept C

FOUR LANES, BUFFERED BIKE LANES, REMOVE PARKING ON ONE SIDE

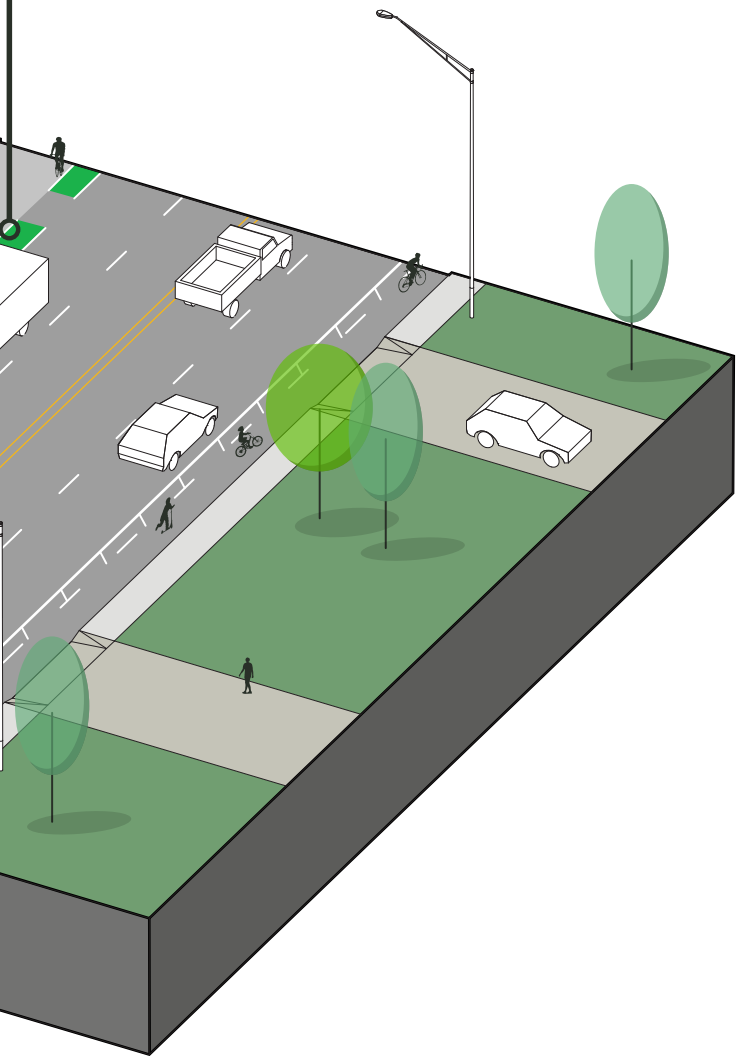
BENTON ST FROM LAWRENCE EXPWY TO LIVE OAK DRIVE + KIELY BLVD TO MARYANN DR

- 4 Traffic lanes
- Class II buffered bike lanes
- Conflict striping at bus stops
- Maintain on-street parking on one side

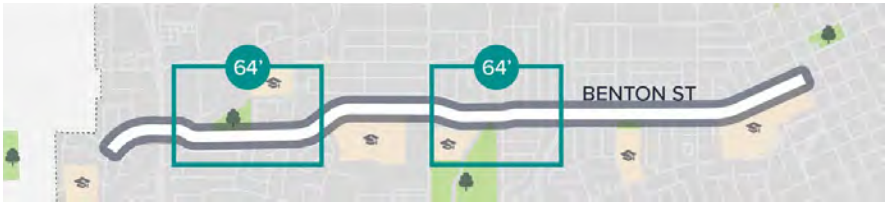


BUS MIXING ZONE
Green striping helps warn users of potential conflict between buses and cyclists.

Buffer area maintains consistent vehicle lane width.



EXAMPLE OF BUFFERED BIKE LANES
A buffer between vehicle traffic provides additional comfort for cyclists.



LINE

Figure 17. Concept C: Four Lanes, Buffered Bike Lanes, Remove Parking on One Side for Benton Street 64-Foot-Wide Typical Section – Santa Clara High School

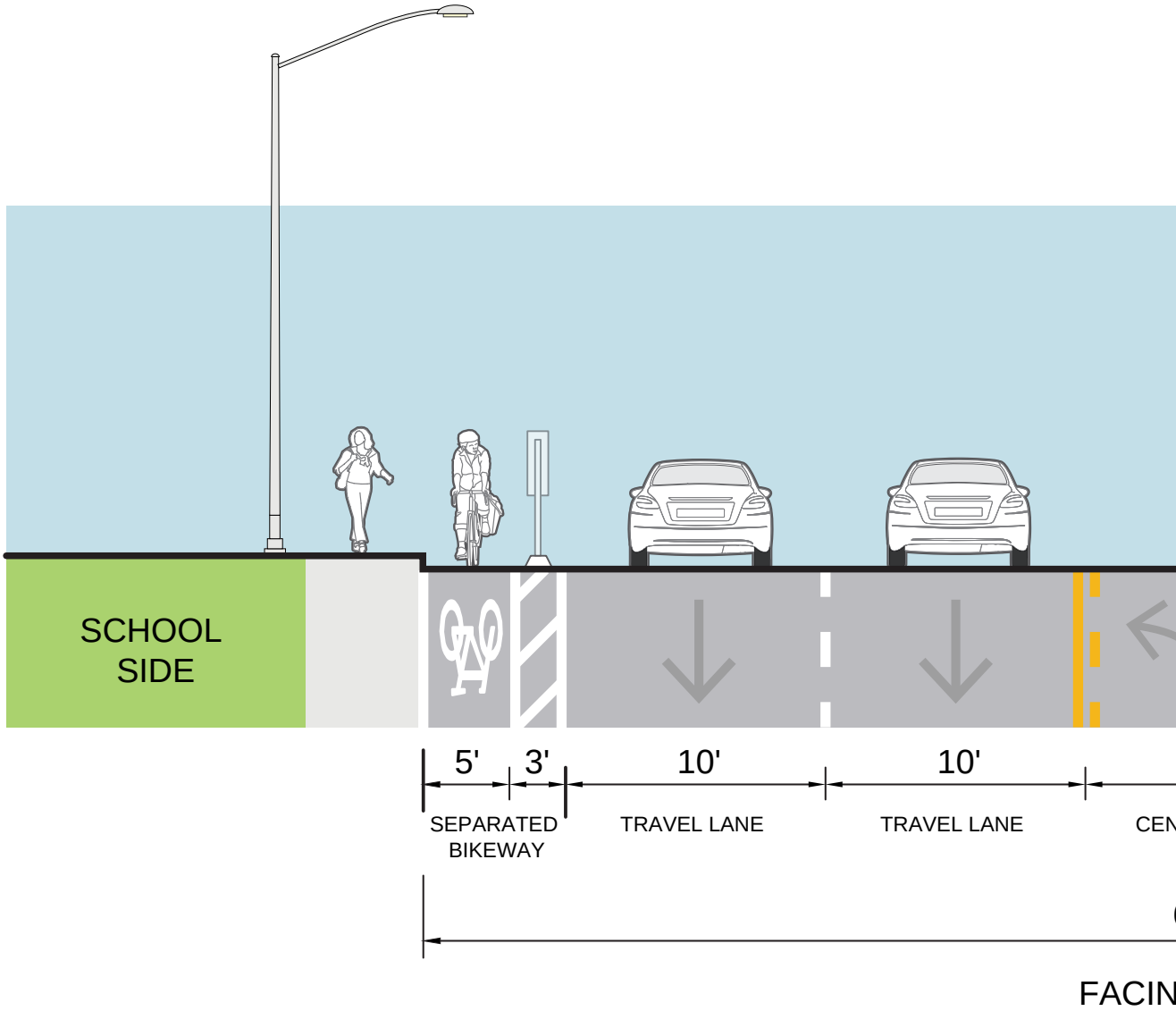
64’ WIDE

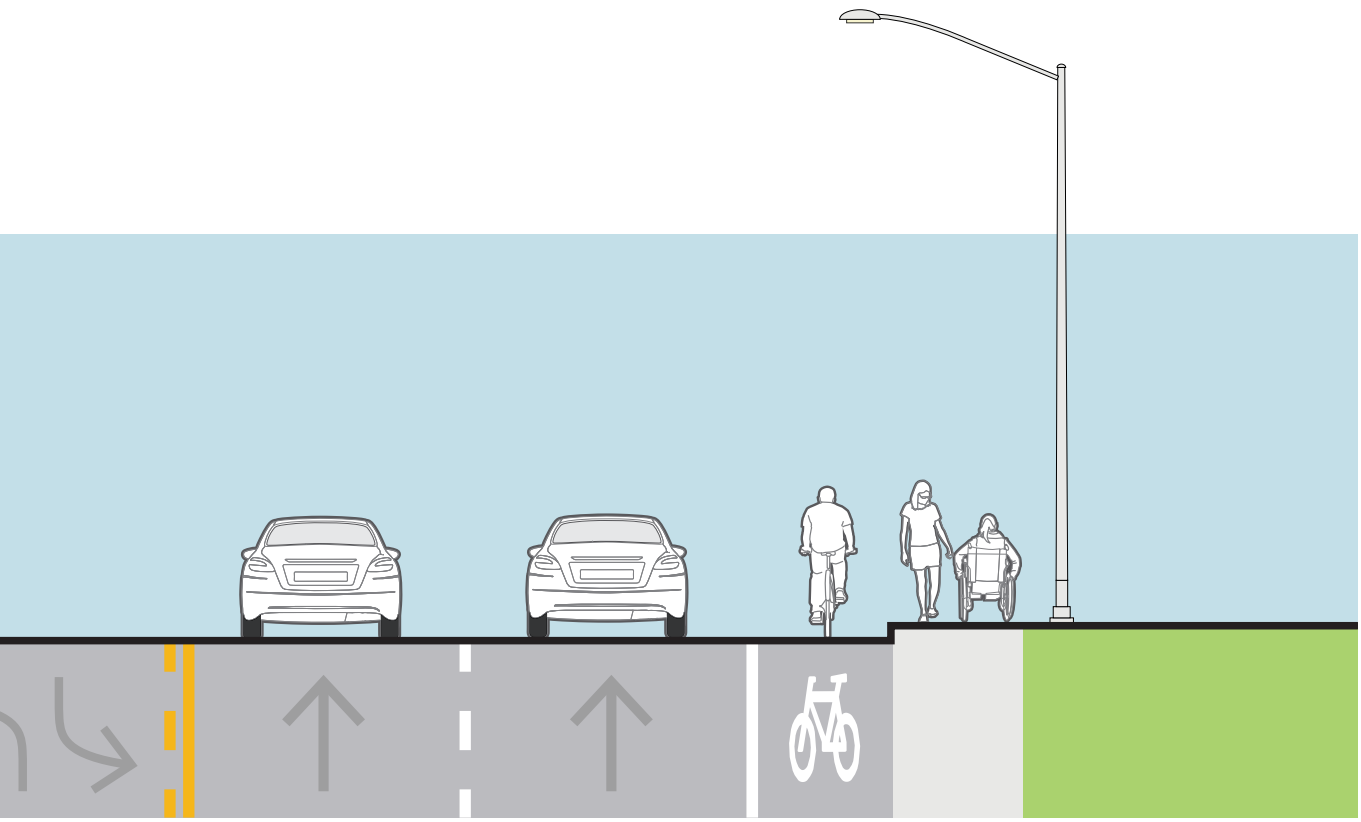
Concept C

ALONGSIDE HIGH SCHOOL

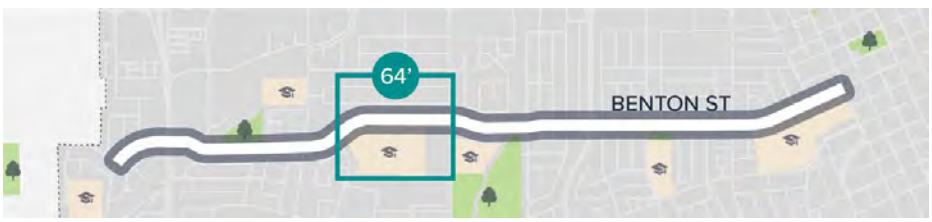
BENTON ST FROM LIVE OAK DR TO KIELY BLVD

- South side protected bike lane - in front of high school
- North side bike lane - in front of residences
- Remove parking on residential side




11'
10'
10'
5'
ITER LANE
TRAVEL LANE
TRAVEL LANE
BIKE LANE
64'

IG WEST


64'
BENTON ST

Corridor Design Concepts – 38-Foot Width

Concept D: Bicycle Boulevard, Parking on Both Sides

This concept has two travel lanes that are shared with bicycles to create a bicycle boulevard (Class IIIB). Striping, signage, wayfinding, and traffic calming features are added to this segment to promote safe travel for all users of the shared facility. The traffic calming features must comply with the City's Neighborhood Traffic Calming Program. The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 18**.

Concept E: Buffered Bike Lanes, Remove Parking on Both Sides

This concept has two travel lanes. Parking is restricted on both sides of the street. An eight-foot-wide buffered bicycle lane (Class IIB) is added to each side of the street, with five feet of bikeway and three feet of buffer. The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 19**.

Concept F: Bike Lanes, Remove Parking on One Side

This concept has two travel lanes. Parking will be removed from the north side, as that would have the least impact on parking supply on the Benton Street 38-foot-wide section. A minimum five-foot-wide bike lane (Class II) is added to each side of the street. Vehicle travel lanes are reduced to 10 feet wide. The cross-section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 20**.

Figure 18. Concept D: Bicycle Boulevard, Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section

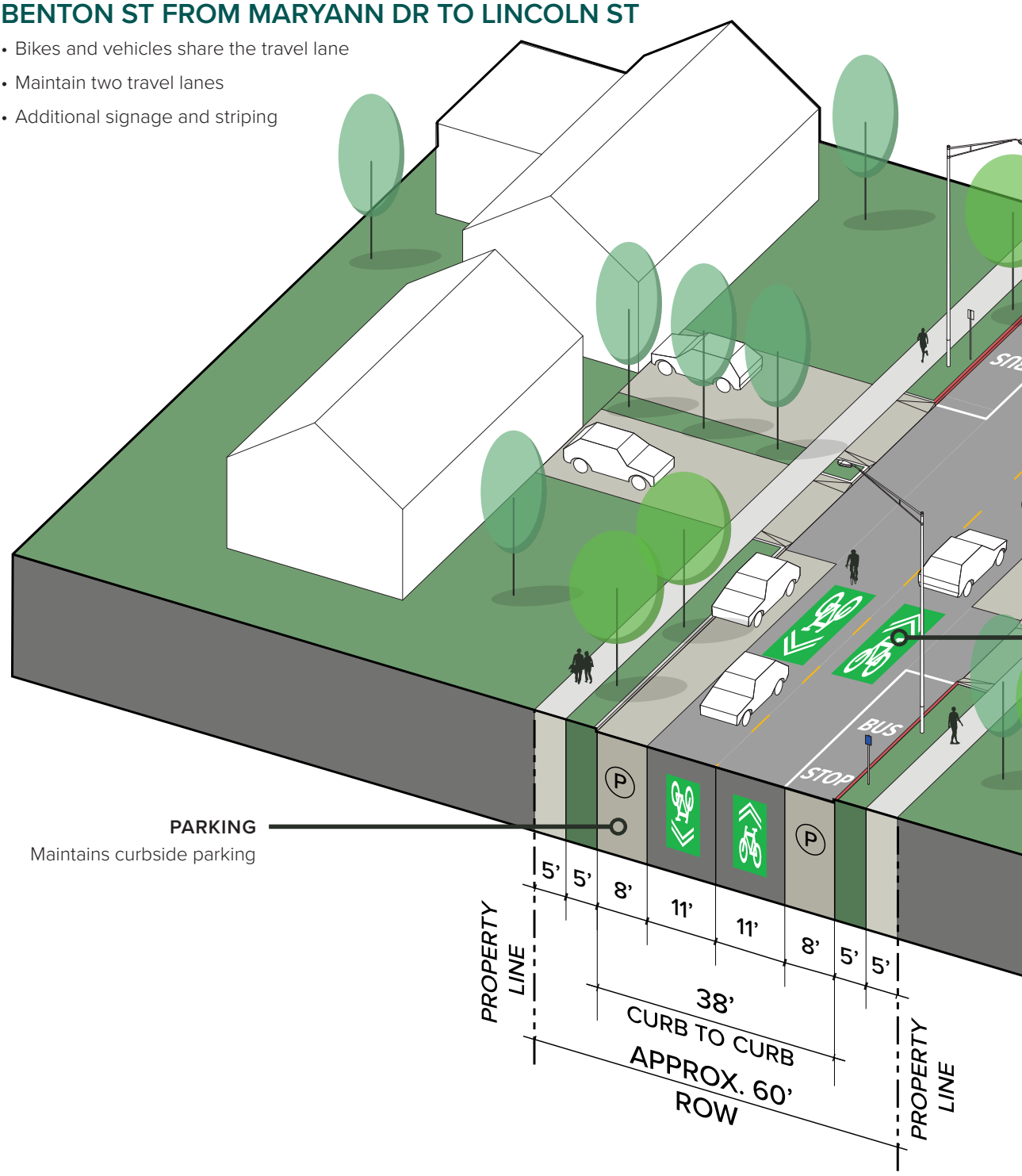
38’ WIDE TYPICAL

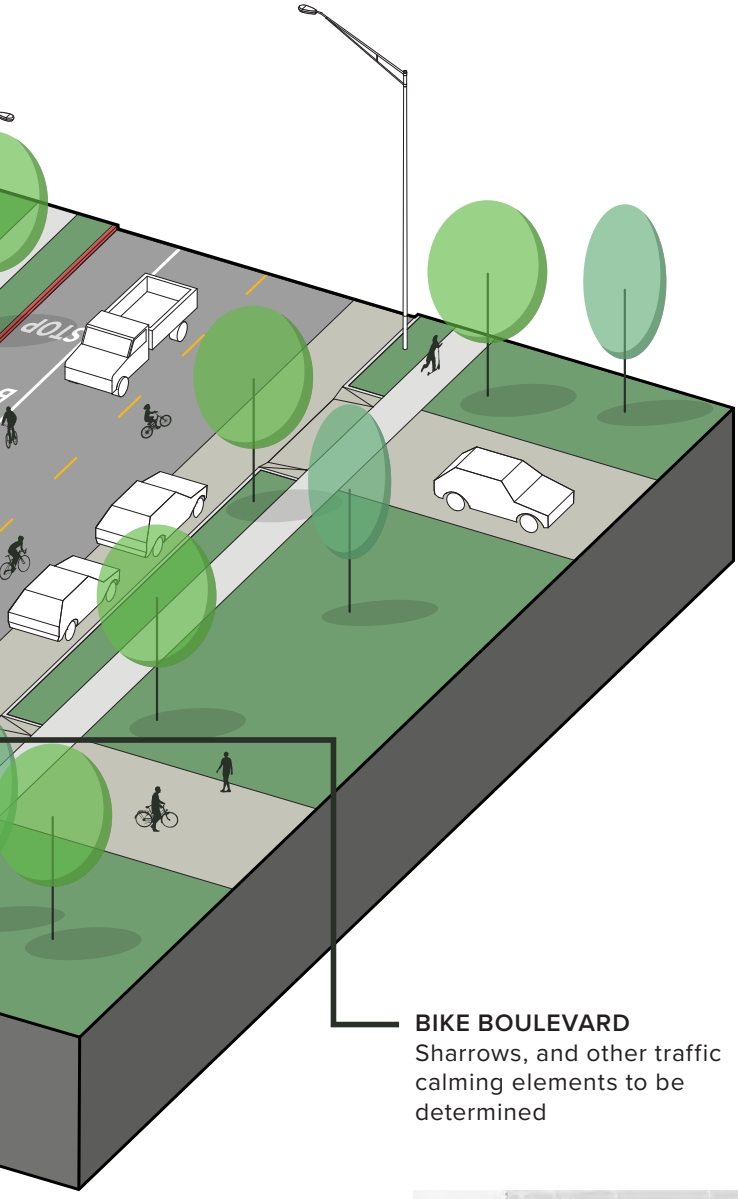
Concept D

BICYCLE BOULEVARD, PARKING ON BOTH SIDES

BENTON ST FROM MARYANN DR TO LINCOLN ST

- Bikes and vehicles share the travel lane
- Maintain two travel lanes
- Additional signage and striping





BIKE BOULEVARD
Sharrows, and other traffic calming elements to be determined

BIKE BOULEVARD
Bike boulevards share roadway priority with cyclists. Traffic calming elements may be introduced to deter excess vehicle speeds for comfort and safety on the shared roadway.

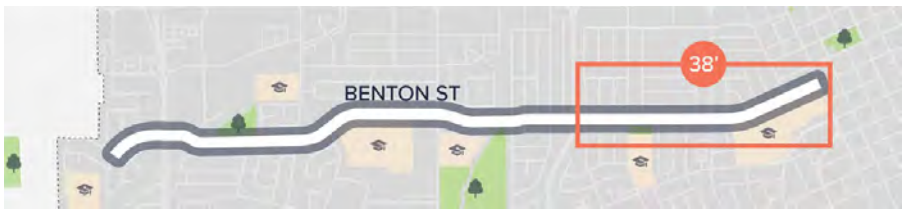


Figure 19. Concept E: Buffered Bike Lanes, Remove Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section

38' WIDE TYPICAL

Concept E

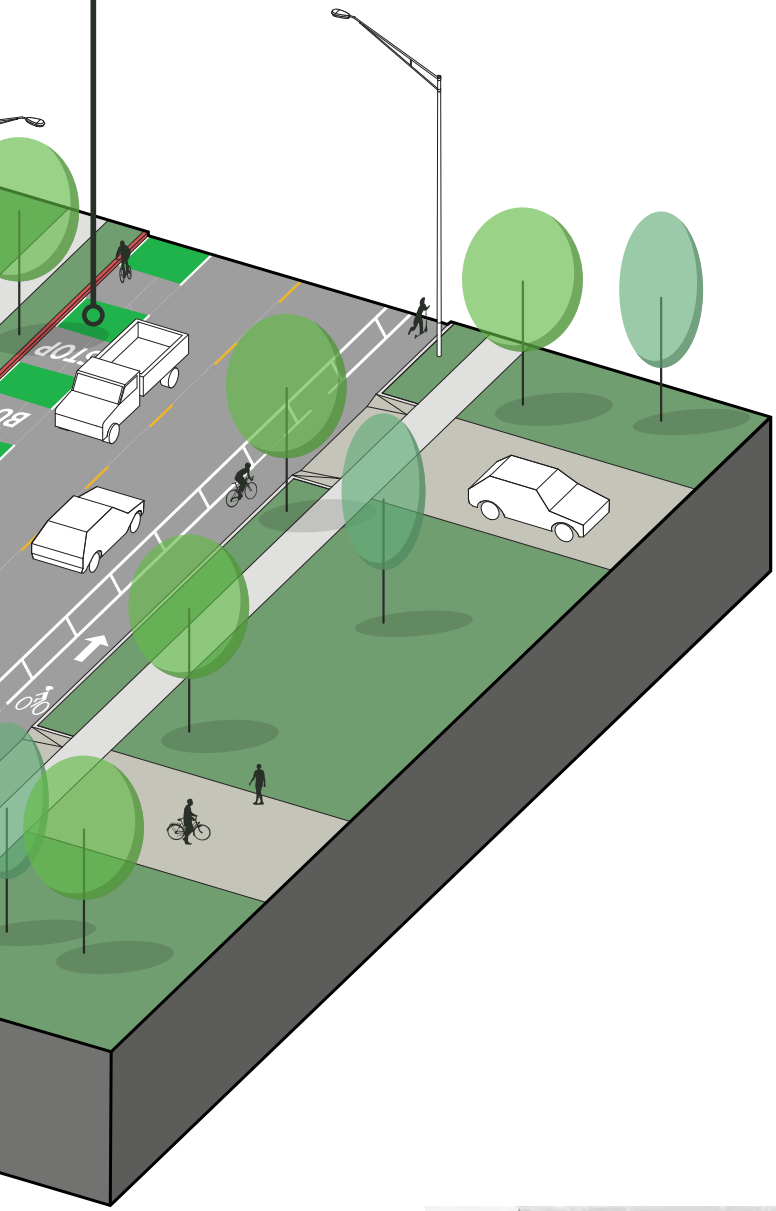
BUFFERED BIKE LANES, REMOVE PARKING ON BOTH SIDES

BENTON ST FROM MARYANN DR TO LINCOLN ST

- Maintain two travel lanes
- Buffered bike lanes
- Parking removed

BUS MIXING ZONE
Green striping helps warn users of potential conflict between buses and cyclists.

Buffer area maintains consistent vehicle lane width.



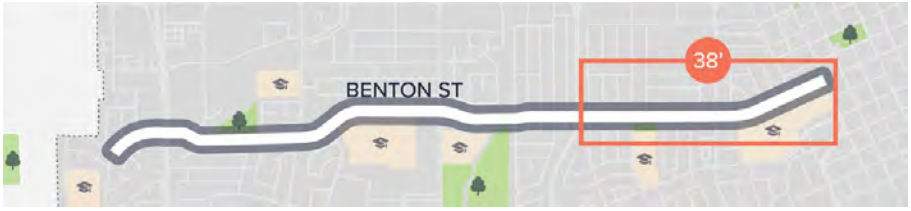


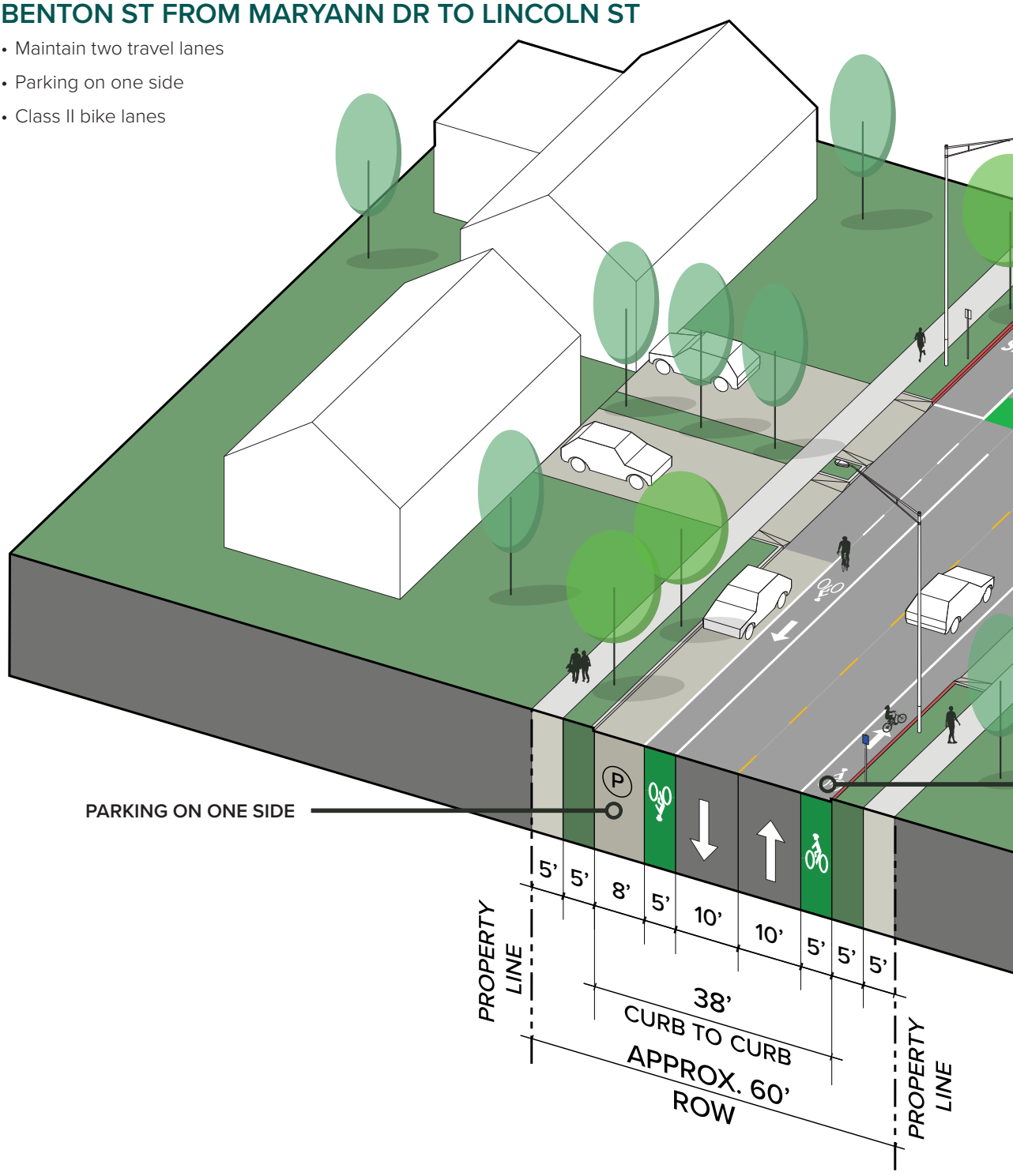
Figure 20. Concept F: Bike Lanes, Remove Parking on One Side for Benton Street 38-Foot-Wide Typical Section

38’ WIDE TYPICAL

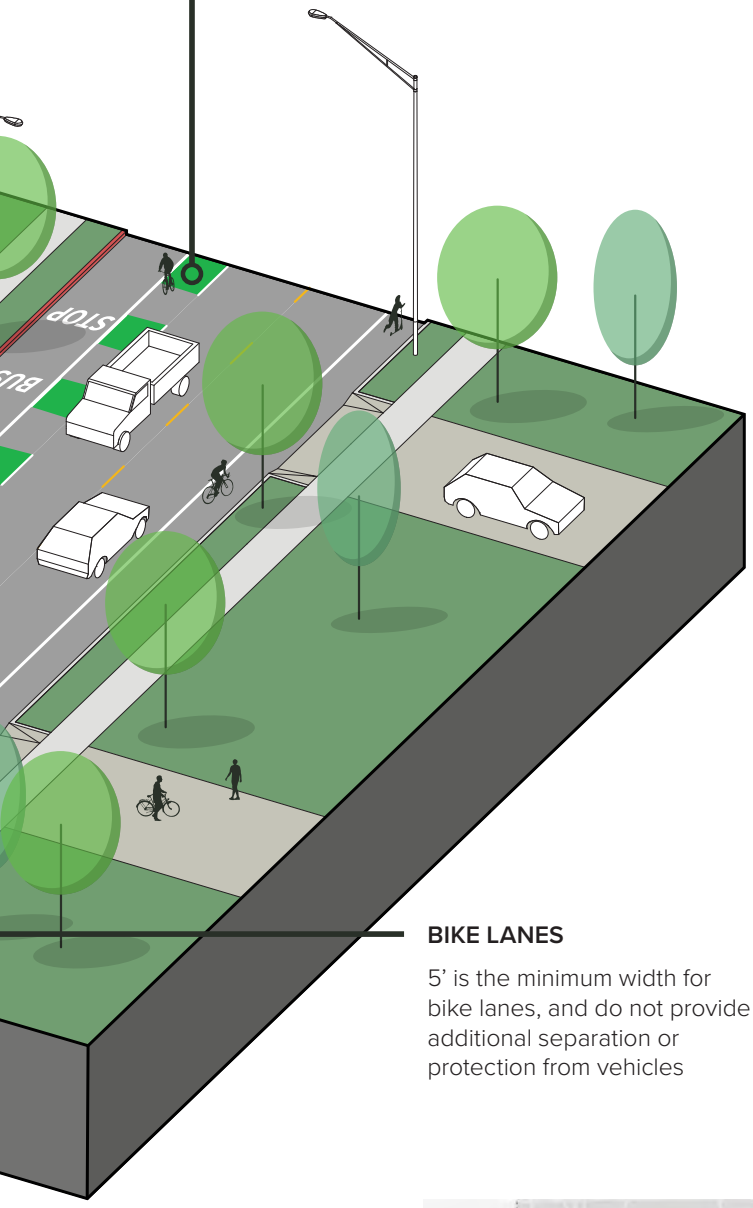
Concept F

BIKE LANES, REMOVE PARKING ON ONE SIDE
BENTON ST FROM MARYANN DR TO LINCOLN ST

- Maintain two travel lanes
- Parking on one side
- Class II bike lanes

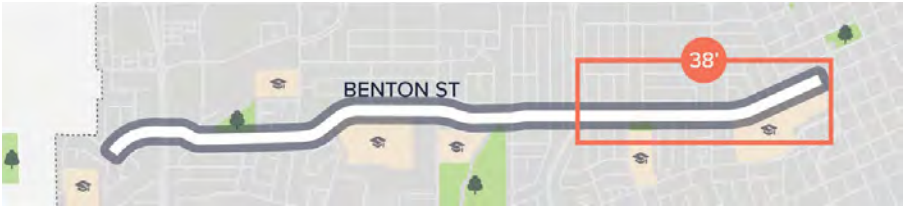


CONFLICT STRIPING
Conflict striping at bus stops for user awareness and bus crossing bike lanes



BIKE LANES

5’ is the minimum width for bike lanes, and do not provide additional separation or protection from vehicles



Corridor Design Concept – 60-Foot Width

Concept G: Two Lanes, Buffered Bike Lanes, Parking on Both Sides for Benton Street from Dunford Way to Lawrence Expressway

This concept keeps two travel lanes but reduces the lane width from 20 feet to 12 feet. 10 feet parking lane is maintained on both sides of the street. An eight-foot-wide buffered bicycle lane (Class IIB) is added to each side of the street, with five feet of bikeway and three feet of buffer. The section design detail and more information on proposed dimensions and considerations for this concept can be seen in **Figure 21**.

Lessons Learned in Trash Collection with Separated Bikeways

Separated bikeways provide a key investment in the safety and comfort of roadways for all users. With these configuration changes come layered discussions about curbside management, including trash collection, as California Vehicle Code 21211 (b) prohibits the placement of bins in travel lanes and bikeways. These concerns can be mitigated with design and programmatic solutions. Specific designs for this corridor could include regular breaks in bikeway curbs or planting strips (particularly around driveways), targeted sections of painted buffers with spaced vertical elements, such as bollards or flex posts, and mountable curbs in areas designated for bins. Programmatic solutions could include postcard mailers to residents, stickers for bins with placement instructions, and City staff presence around the first few trash days to engage residents and businesses. These solutions can allow regular weekly trash collection in the design concepts.

Additionally, the City's Annual Cleanup Campaign for bulky item pickup is a part of considerations for the design. No Build Option, Concepts A, D, and G allow the Annual Cleanup Campaign to operate the same as the current set-up where residents can temporarily place the bulky items next to the curb. Concepts B, C (south side only), E, and F (north side only) would impede the pick-up of bulky items when bike lanes are next to the curb, or if no on-street parking space or shoulder is available. If Concept B, C, E, or F is selected, there are currently alternative programmatic options for disposal of bulk and hazardous items listed on the City's website, including on-call pickups and disposal sites.

The 2017 Fresno Class IV Bikeway Design Guide provides guidance on loading and garbage access for larger collections and dumpster pickup. The City of Los Gatos coordinated with their residential trash collection service provider to identify areas for bin placement on Winchester Boulevard, as noted in their 2021 FAQ document for the community. In 2022, the City of Petaluma implemented a demonstration project on Rainer Avenue that included a parking-protected separated bikeway in a single-family residential area. The project includes a

Designated trash bin locations at driveways on the Rainier Avenue Paving and Traffic Calming Upgrades Project, City of Petaluma, CA

Loading and Garbage Access at Mid-Block Locations (Source: 2017 Fresno Class IV Bikeway Design Guide)

combination of red curbs and painted buffers around driveways, creating a designated space for trash bins. This demonstration project used paint and flexible posts and is moving forward to become permanent. Similarly, the City of San Luis Obispo created designated trash bin space on the North Chorro Neighborhood Greenway. The Richmond Wellness Trail in the City of Richmond also left space or painted buffers to accommodate bins and large item pickup.

On the programmatic side, Napa launched a Don't Trash the Bike Lane effort to educate community members on how to place bins to keep bike lanes clear and safe for users. Los Gatos coordinated with their residential trash collection service provider and several multifamily residences with commercial garages to identify specific areas for community members to place bins on Winchester Boulevard, as noted in their 2021 FAQ document.

Figure 21. Concept G: Two Lanes, Buffered Bike Lanes, Parking on Both Sides for Benton Street from Dunford Way to Lawrence Expressway

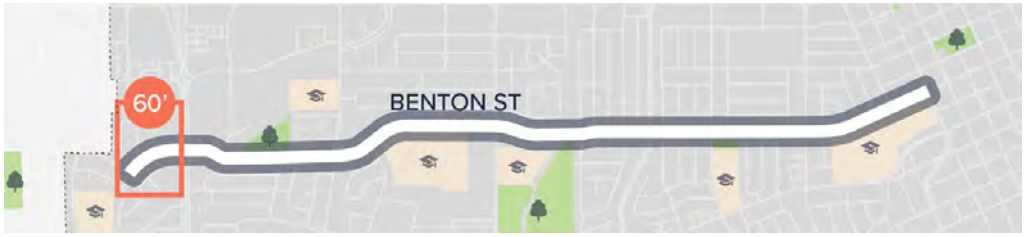
60’ WIDE

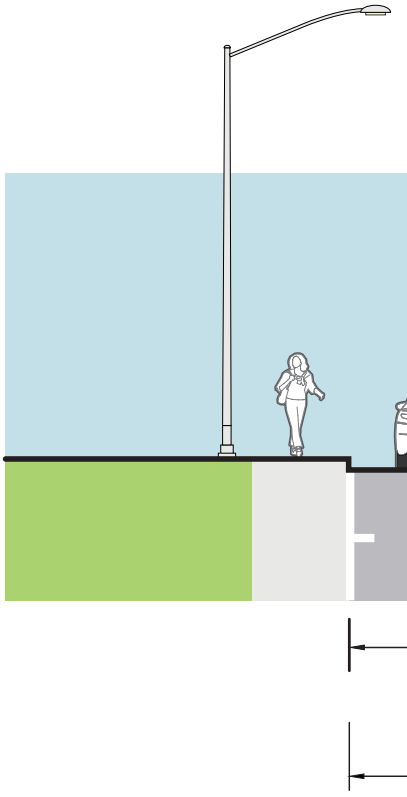
Proposed Concept G

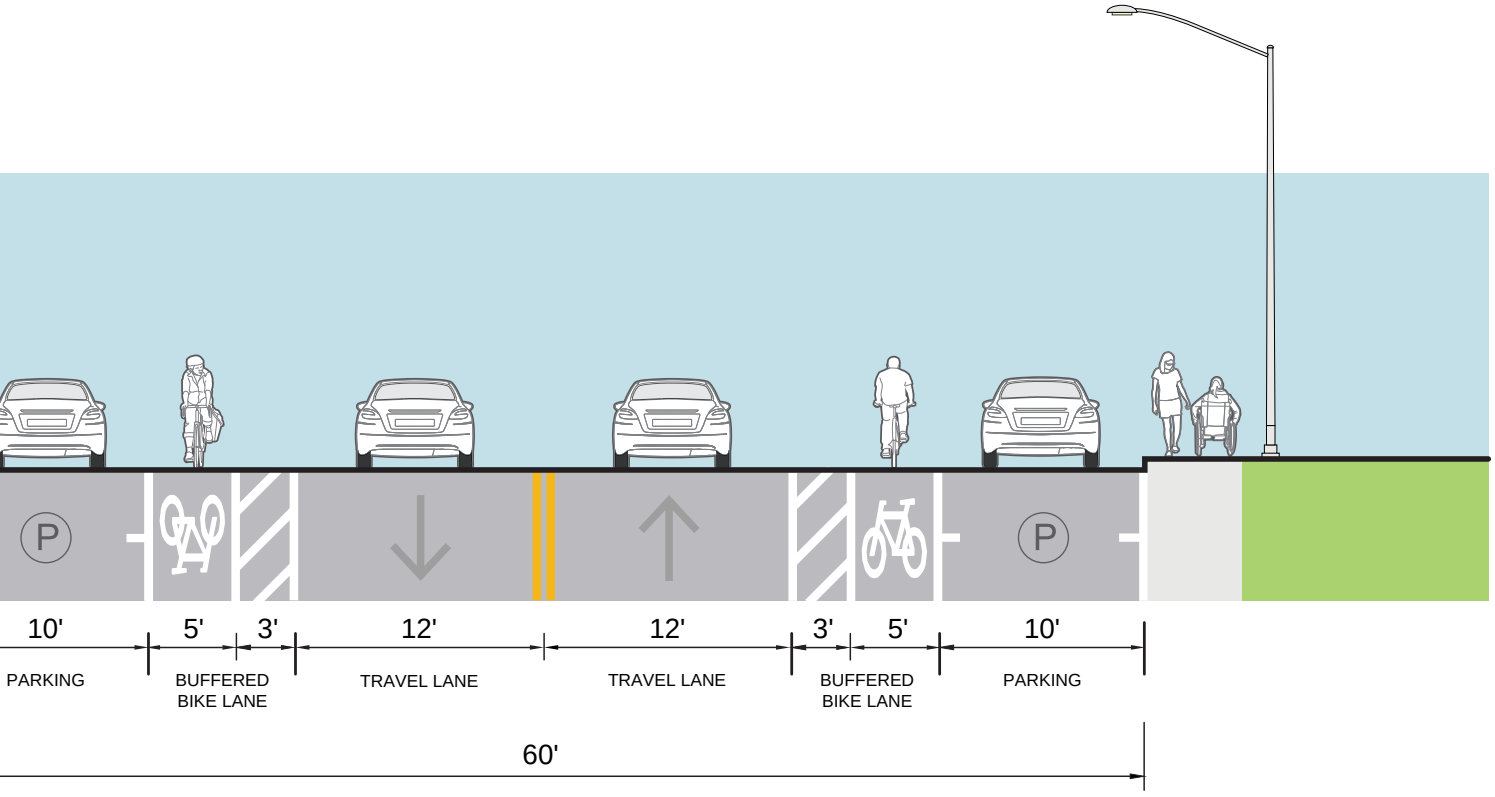
VARIATION FROM TYPICAL EXISTING CONDITION

BENTON ST FROM DUNFORD WAY TO LAWRENCE EXPWY

- Buffered bike lanes
- Standardized travel lanes






P
P
10'
5'
3'
12'
12'
3'
5'
10'
PARKING
BUFFERED BIKE LANE
TRAVEL LANE
TRAVEL LANE
BUFFERED BIKE LANE
PARKING
60'
FACING WEST

Traffic Analysis

Safety

COLLISION REDUCTION ESTIMATE

Using the latest data from the Caltrans Local Roadway Safety manual and the Federal Highway Administration Crash Modification Factors (CMFs) for roadway changes, the planning team conducted a collision analysis for Benton Street. A CMF is a multiplicative factor used to compute the expected number of crashes after implementing a given countermeasure at a specific site. The project team used a CMF of 0.65 associated with the safety countermeasure of "road diet" (reducing travel lanes from four to three and adding a two-way center left-turn and bike lanes) for collisions in Concepts A and B. The team then applied a CMF of 0.75 with the countermeasure of "install bike lanes," to bicycle collisions only, in Concepts A through C and E through G. The countermeasure of "bike boulevard" was applied, to bicycle collisions only, in Concept D. The "bike boulevard" CMF will apply only if traffic calming measures are installed, such as speed humps or other traffic calming measures.

From 2017 to 2022, there were 122 vehicle-to-vehicle collisions and 16 collisions involving a bicyclist. These numbers serve as the baseline for the No Build or Existing Conditions concept. The analysis estimates how many collisions would have been avoided during the same time period if each concept was built. In Concept A: Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides for Benton Street 64-Foot-Wide Typical Section, it is anticipated that there would have been 39 fewer vehicle collisions and two fewer bicycle collisions. In Concept B: Two Lanes, Center Turn Lane, Parking-Separated Bikeway for Benton Street 64-Foot-Wide Typical Section, it is anticipated there would have been 39 fewer vehicle collisions and seven fewer bicycle collisions. This concept would have resulted in the highest estimated safety benefits for drivers and bicyclists. In Concept C: Four Lanes, Buffered Bike Lanes, Remove Parking on One Side for Benton Street 64-Foot-Wide Typical Section, it is anticipated there would have been no reduction in vehicle collisions and two fewer bicycle collisions.

Table 8. Estimated Collision Reductions with Crash Modification Factors (2017–2022)

Concept	Road Diet	Bike Lane Type	Vehicle Collisions Total	Estimated Vehicle Collisions Reduced	Bike Colli Tota
Existing Conditions/ No Build (64')	**-**	**-**	**105**	**-**	**13**
Concept A (64') (estimated)	Yes	Buffered	66	39	11
Concept B (64') (estimated)	Yes	Parking-protected	66	39	6
Concept C (64') (estimated)	No	Buffered	105	0	11
Existing Conditions/ No Build (38')	**-**	**-**	**17**	**-**	**3**
Concept D (38') (estimated)	No	Bike Boulevard	17	0	1
Concept E (38') (estimated)	No	Buffered	17	0	2
Concept F (38') (estimated)	No	Bike Lane	17	0	2

The actual number of crashes that occurred from 2017 to 2022 under Existing Conditions serve as the baseline numbers for this time period. This analysis estimates how concept was built. For example, under Concept A, there would likely have been 11 bike collisions, which is a reduction of 2 from the baseline of 13.

In the Benton Street 38-Foot-Wide Typical Section, it is anticipated that there would not have been any notable reduction in vehicular collisions, as there would have been no change to the number of vehicle lanes. However, the introduction of bike lanes and bike boulevards would have reduced bicycle collisions. In Concept D: Bicycle Boulevard, Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section, it is anticipated that there would have been two fewer bicycle collisions. This concept would have resulted in the highest estimated safety benefits for bicyclists, assuming the implementation of traffic calming measures. In Concept E: Buffered Bike Lanes, Remove Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section, it is anticipated there would have been one fewer bicycle collision, as is the same with Concept F: Bike Lanes, Remove Parking on One Side for Benton Street 38-Foot-Wide Typical Section. Although not modeled on this short stretch, Concept G: Two Lanes, Buffered Bike Lanes, Parking on Both Sides for Benton Street from Dunford Way to Lawrence Expressway would have reduced bicycle collisions by introducing a buffered bike lane. The results of the collision analysis are included in **Table 8: Estimated Collision Reductions with Crash Modification Factors (2017–2022)**.

isions l	Estimated Bike Collisions Reduced	Total Collisions	Estimated Total Collisions Reduced
	-	**118**	-
	2	77	41
	7	72	46
	2	116	2
	-	**20**	-
	2	18	2
	1	19	1
	1	19	1

many collisions would likely have been avoided during the same time period, if each

Traffic Diversion

To determine the traffic that would be diverted from Benton Street to El Camino Real and Homestead Road as a result of the road diet, the City's travel demand model was utilized. Existing and Existing Plus Road Diet travel demand models were run to determine volumes along the corridors for each scenario. The Existing travel demand model provides a baseline condition where Benton Street is two lanes in each direction between Lawrence Expressway and San Tomas Expressway. The Existing Plus Road Diet travel demand model was created by adjusting the model's network and reducing the travel lanes from two lanes to one lane in each direction along the study corridor between Lawrence Expressway and San Tomas Expressway. The volume difference between the two scenarios represents the traffic diversion as a result of the road diet. On Benton Street, it was estimated an average of 38% reduction in traffic for the westbound direction and a 5% reduction for the eastbound direction for the entire segment during the weekday AM peak hour. There would be an estimated average 4% reduction in traffic for the westbound direction and 33% reduction for the eastbound direction for the entire segment during the weekday PM peak hour. It should be noted that traffic diversion is not assumed during the Saturday and weekday midday peak hours as there is sufficient capacity along Benton Street to accommodate existing traffic with the road diet. **Appendix A-2: Traffic Analysis Memo** diagrams the modeled changes in traffic diversion in **Figures 6-9** of that memo.

Traffic Operations

TRAVEL TIME

The project team evaluated the time it takes to travel the entire length of the study corridor in a car at multiple periods (weekday morning between 7:00 and 9:00 a.m., midday between 1:30 and 3:30 p.m., and evening between 4:00 and 6:00 p.m., and on Saturday between 11:30 a.m. and 1:30 p.m.). The project team then modeled the estimated time it would take to travel the length of the study corridor under Concepts A and B, which both involve the reduction of one travel lane.

During the busiest time of day going westbound (AM peak period between 7:00 and 9:00 a.m.), it takes 15 minutes and 39 seconds to travel the entire corridor. That would increase by 53% to 23 minutes and 58 seconds under Concepts A and B. The AM peak period includes high school traffic, whereas PM peak period would be minimally affected by high school traffic.

During the busiest time of day going eastbound (PM peak period between 4:00 and 6:00 p.m.), it takes 13 minutes and 40 seconds to travel the entire corridor. That would increase 60% to 21 minutes and 49 seconds under concepts A and B. The full results of the travel time analysis are in **Table 9: Modeled Travel Time Changes (in minutes)**.

Table 9. Modeled Travel Time Changes (in minutes)

Time Period	No Build and Concepts C, D, E, F, & G (min:sec)	Lane Removal – Concepts A & B (min:sec)	Travel Time Increase (min:sec and %)	
Westbound				
AM Peak	15:39	23:58	08:19	53%
PM Peak	11:47	16:05	04:18	36%
Midday	11:10	11:25	00:15	2%
Saturday	09:22	09:25	00:03	0%
Eastbound				
AM Peak	10:49	11:32	00:43	7%
PM Peak	13:40	21:49	08:09	60%
Midday	10:38	11:07	00:29	4%
Saturday	09:25	09:36	00:11	2%

NOTES:
Travel times represent modeled times and are above the average time recorded with field data during peak travel periods.

Concept D would not remove lanes, but it would introduce traffic calming measures, such as speed humps, which may affect unmodeled travel time.

LEVEL OF SERVICE

The project team also modeled the traffic delay or Level of Service (LOS) at 36 intersections along the study corridor and surrounding streets. Based on the level of delay, each intersection gets a letter grade A through F. Intersections with LOS A through D meet City standards. Intersections with LOS E meet standards for El Camino Real (a state highway) and any County expressway. Otherwise, LOS E and F are considered substandard.

Of the 36 intersections studied, three are currently substandard in the AM peak period and three are substandard in the PM peak period on weekdays. Under Concepts A and B, which involve the reduction of one travel lane per direction, the number and location of substandard intersections do not change in all four time periods. The results are summarized in **Table 10: Level of Service Analysis Results** and **Figure 22** through **Figure 27**.

The project team also conducted a queuing analysis to evaluate the distance in which cars would queue to turn at intersections to see how each concept might impact that distance. Long queues require motorists to wait through multiple signal cycles to turn and could impact overall traffic delay. Under the lane removal scenario, Concepts A and B, the analysis did not show significant increases in queue lengths at Benton Street intersections except at Benton Street and San Tomas Expressway:

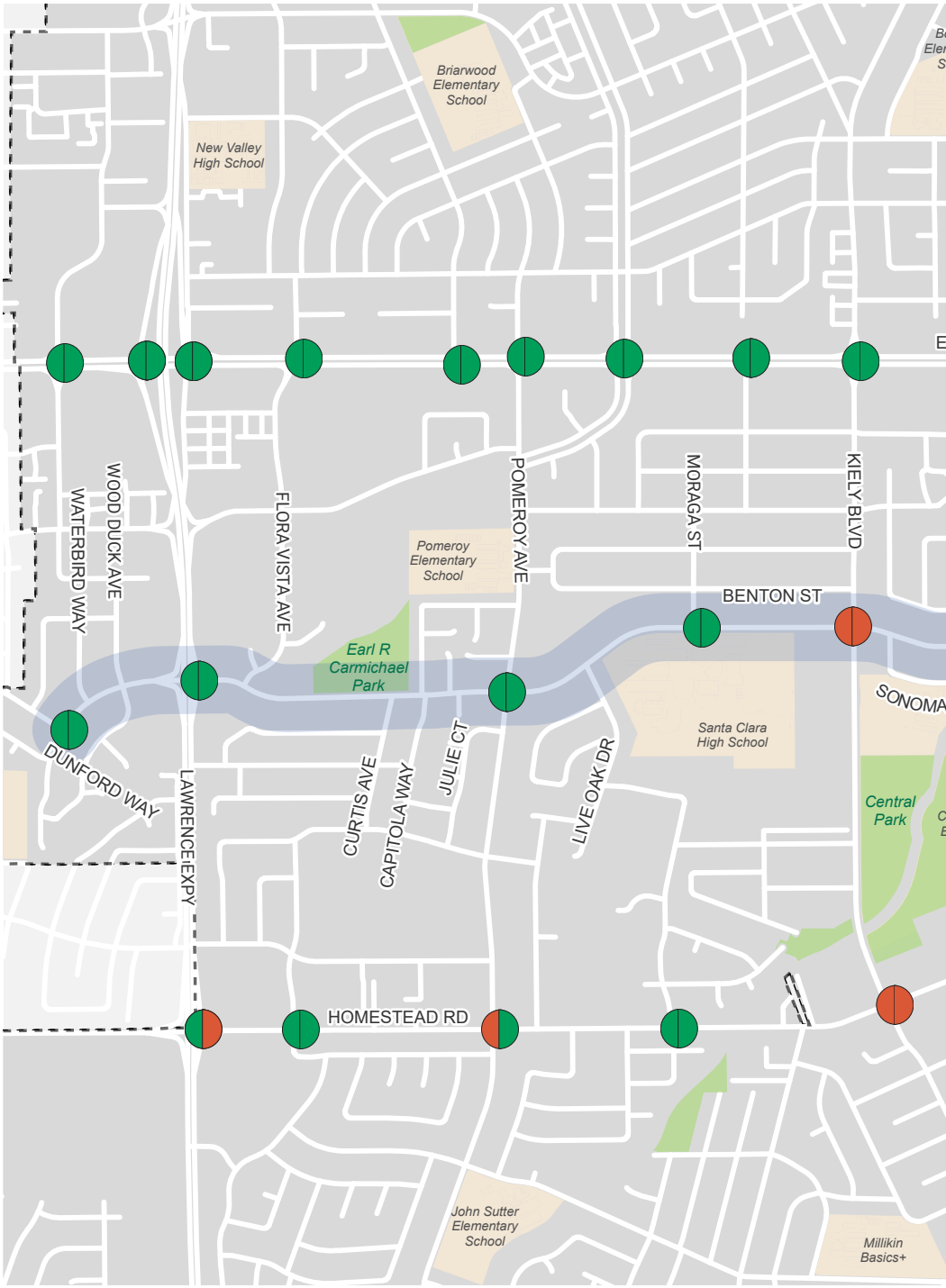
- Westbound right-turn queue is anticipated to increase by approximately six vehicles during the AM peak.
- Southbound left-turn queue is anticipated to increase by approximately two vehicles during the PM peak.

To mitigate the LOS impacts of Concepts A & B, the City could explore signal timing adjustments, optimizing other routes, or promoting transportation demand management strategies such as encouraging carpooling/vanpooling, public transit, and walking or bicycling.

Table 10. Level of Service Analysis Results

Time Period	No Build and Concepts C, D, E, F, & G		Lane Removal – Concepts A & B	
	Meets Standard	Substandard	Meets Standard	Substandard
AM Peak	33	3	33	3
PM Peak	33	3	33	3
Midday	35	1	35	1
Saturday	36	0	36	0

Figure 22. Level of Service Analysis for Existing Conditions and Concept C, D, E, F, and G for weekday AM & PM peak periods



LOS ANALYSIS FOR EXISTING CONDITIONS AND CONCEPTS C, D, E, F, AND G

BENTON STREET

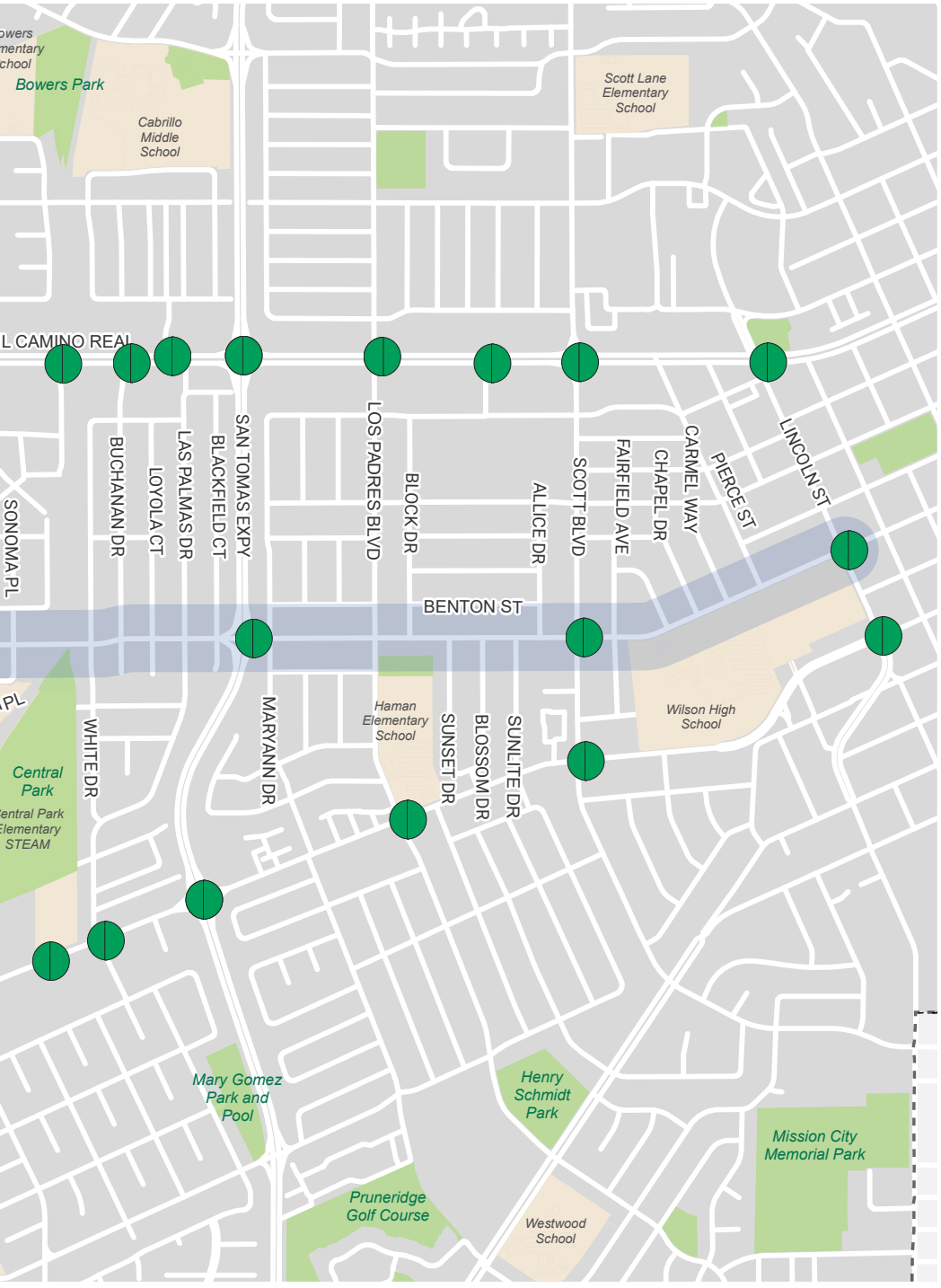

Bowers Park
Cabrillo Middle School
Scott Lane Elementary School
EL CAMINO REAL
SONOMA PL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
LOS PADRES BLVD
BLOCK DR
ALLICE DR
SCOTT BLVD
FAIRFIELD AVE
CHAPEL DR
CARMEL WAY
PIERCE ST
LINCOLN ST
BENTON ST
WHITE DR
MARYANN DR
Haman Elementary School
SUNSET DR
BLOSSOM DR
SUNLITE DR
Wilson High School
Central Park
Central Park Elementary STEAM
Mary Gomez Park and Pool
Henry Schmidt Park
Mission City Memorial Park
Pruneridge Golf Course
Westwood School
LOS ANALYSIS LEGEND
AM PEAK
Meets Standards
Substandard
PM PEAK
Meets Standards
Substandard
City Boundary
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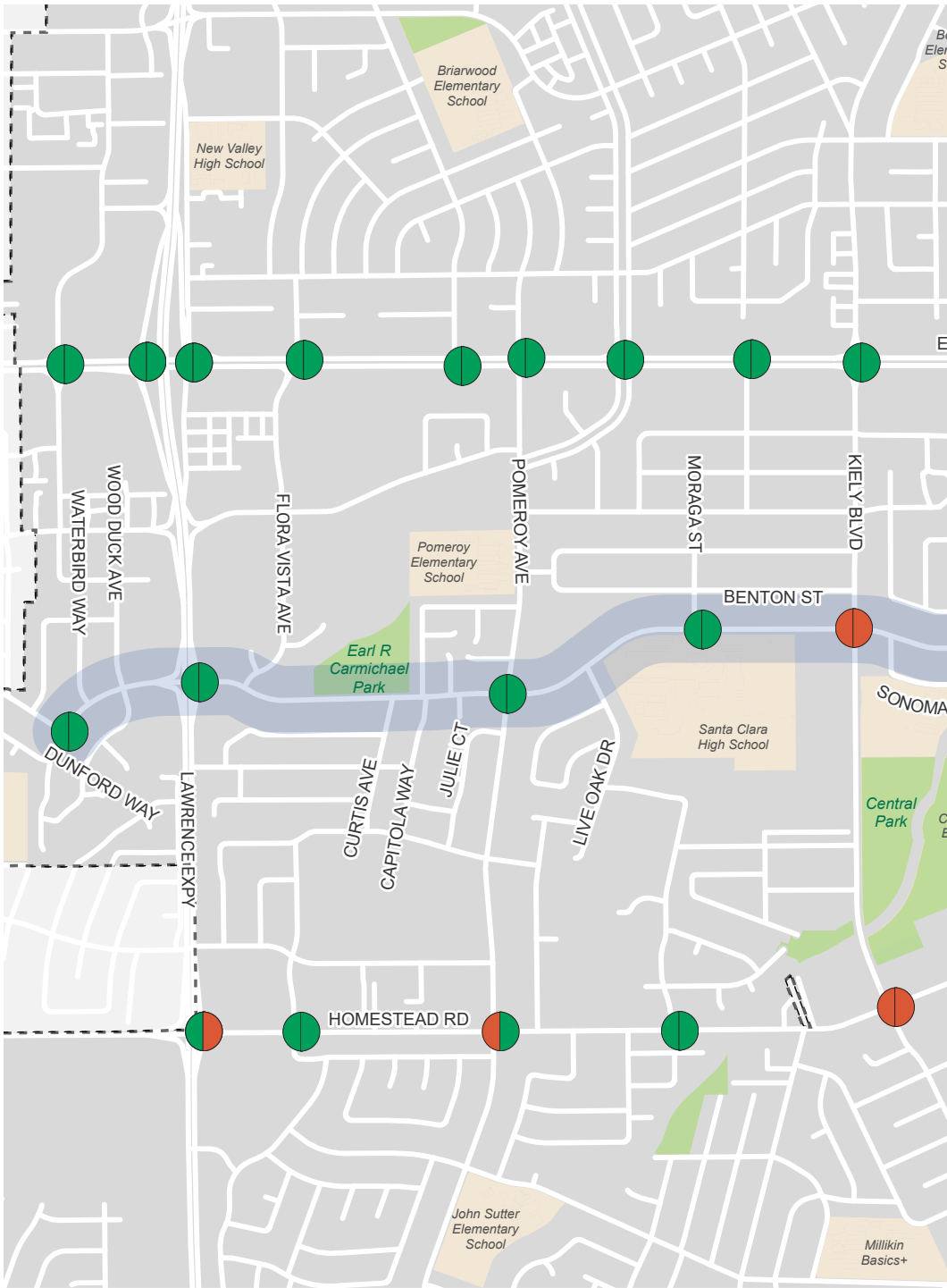
Figure 23. Level of Service Analysis for Concepts A and B (Lane Removal) for weekday AM & PM peak periods



LOS ANALYSIS FOR CONCEPT A: TWO LANES, CENTER TURN LANE, BUFFERED BIKE LANES, PARKING ON BOTH SIDES FOR BENTON STREET AND CONCEPT B: TWO LANES, CENTER TURN LAN PARKING-PROTECTED BIKE LANES

BENTON STREET

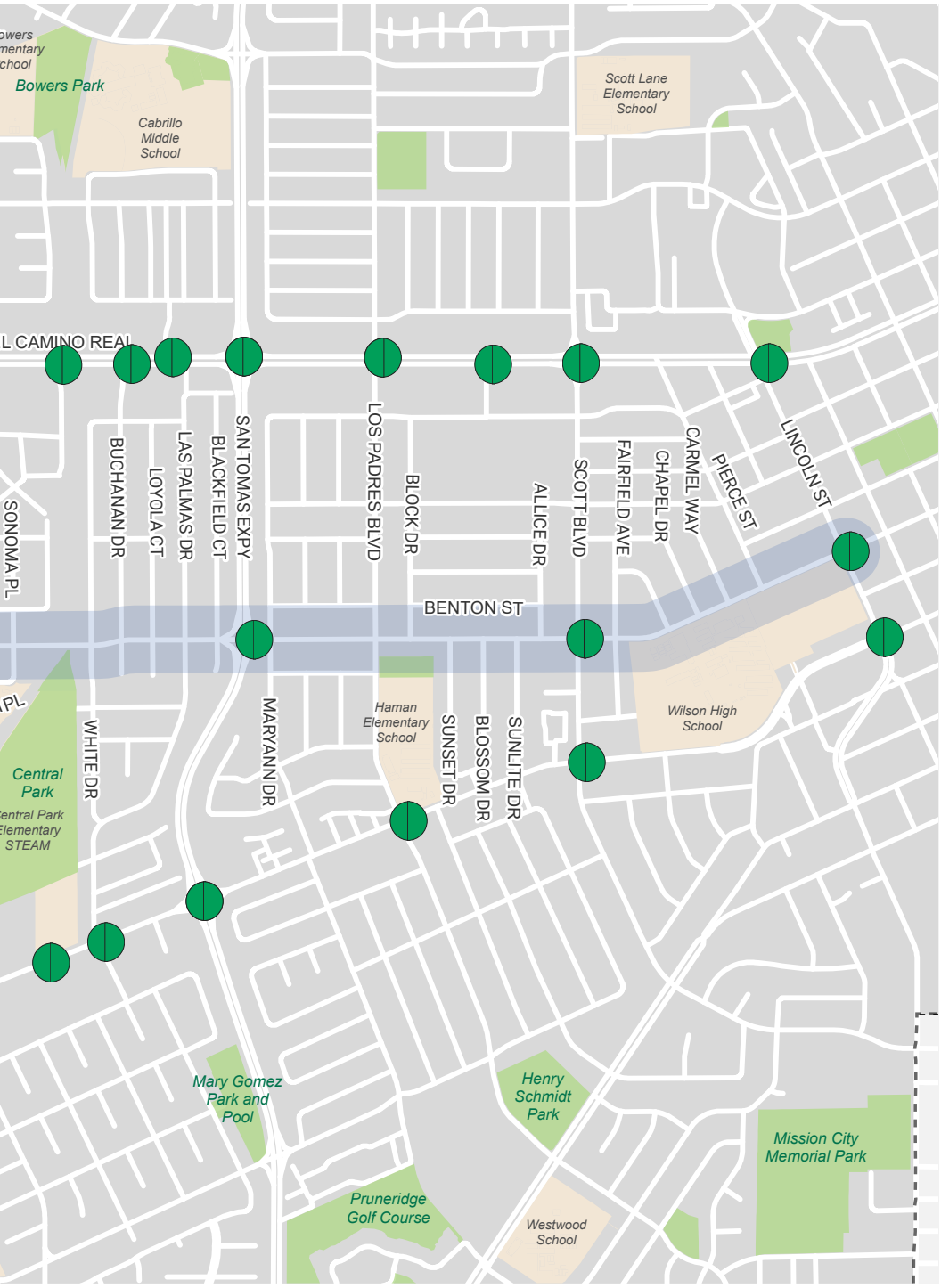

Bowers Park
Cabrillo Middle School
Scott Lane Elementary School
L CAMINO REAL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
LOS PADRES BLVD
BLOCK DR
ALLICE DR
SCOTT BLVD
FAIRFIELD AVE
CHAPEL DR
CARMEL WAY
PIERCE ST
LINCOLN ST
SONOMA PL
BENTON ST
WHITE DR
MARYANN DR
Haman Elementary School
SUNSET DR
BLOSSOM DR
SUNLITE DR
Wilson High School
Central Park
Mary Gomez Park and Pool
Henry Schmidt Park
Mission City Memorial Park
Pruneridge Golf Course
Westwood School
LOS ANALYSIS LEGEND
AM PEAK
Meets Standards
Substandard
PM PEAK
Meets Standards
Substandard
City Boundary
School
Parks
Study Corridor
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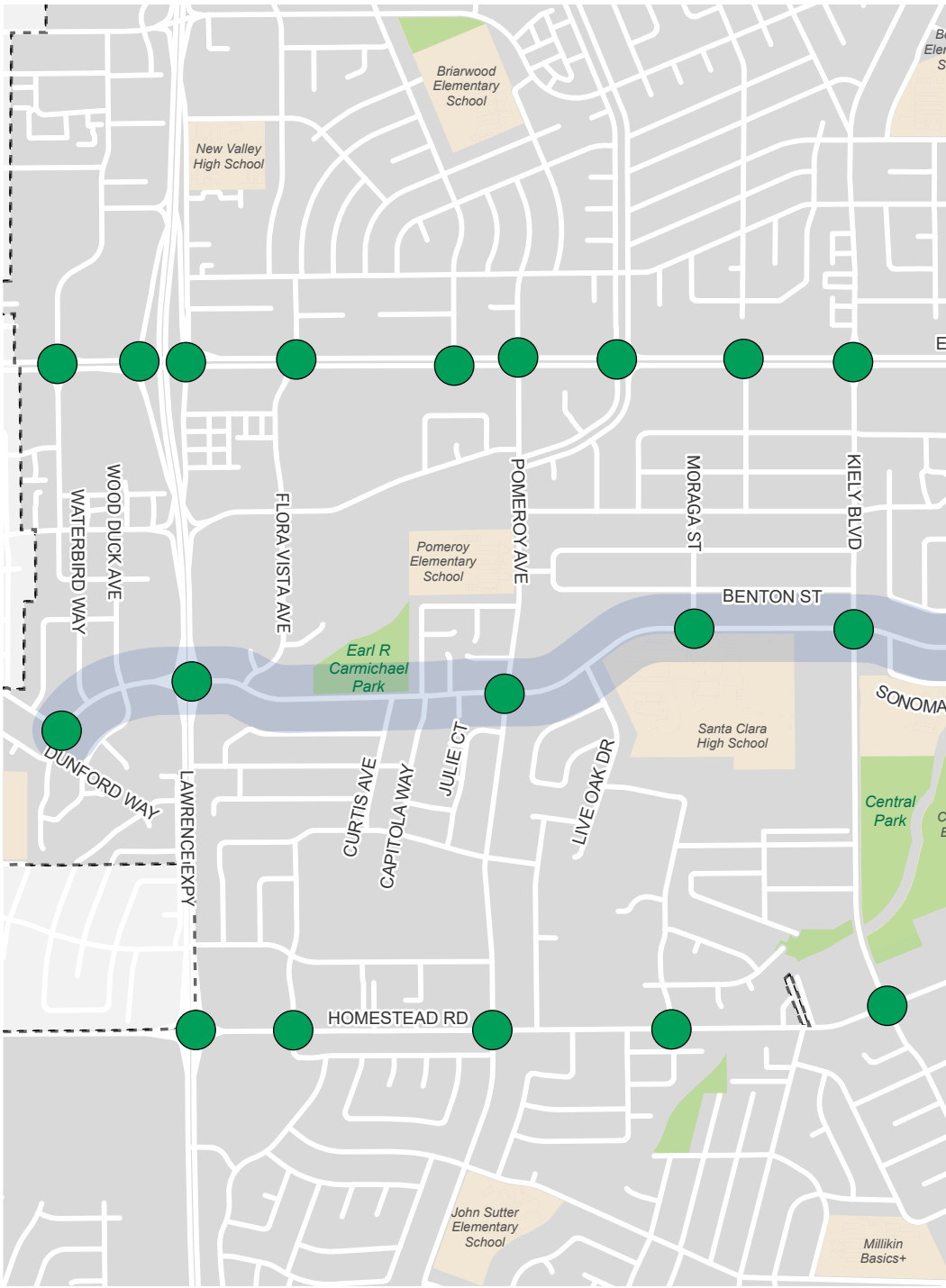
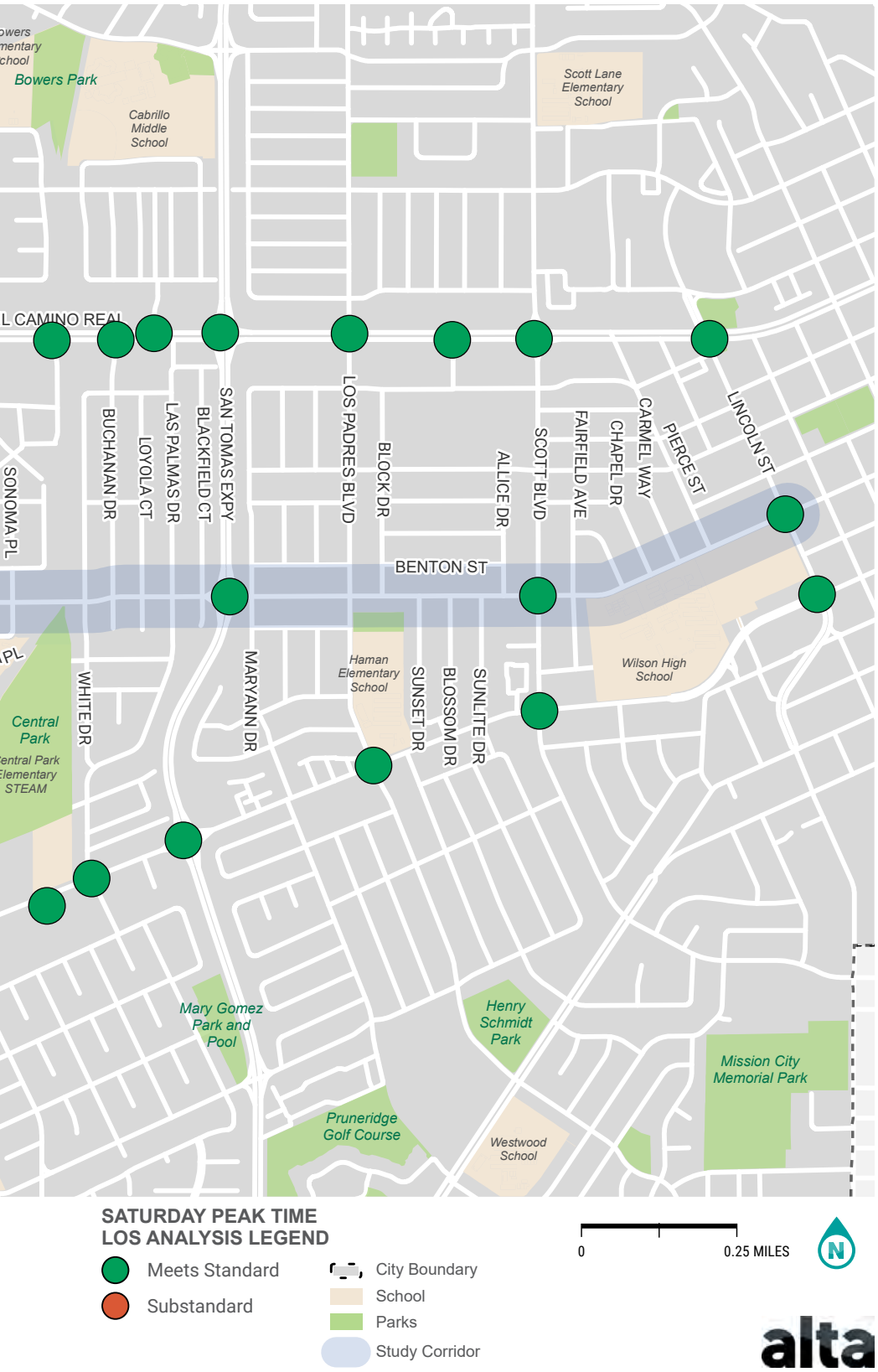
Figure 24. Level of Service Analysis for Existing Conditions and Concept C, D, E, F, and G for Saturday peak periods



SATURDAY PEAK TIME LOS ANALYSIS FOR EXISTING CONDITIONS AND CONCEPTS C, D, E, F, AND G

BENTON STREET


Bowers Park
Cabrillo Middle School
Scott Lane Elementary School
L CAMINO REAL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
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BLOCK DR
ALLICE DR
SCOTT BLVD
FAIRFIELD AVE
CHAPEL DR
CARMEL WAY
PIERCE ST
LINCOLN ST
SONOMA PL
BENTON ST
WHITE DR
MARYANN DR
Haman Elementary School
SUNSET DR
BLOSSOM DR
SUNLITE DR
Wilson High School
Central Park
Mary Gomez Park and Pool
Henry Schmidt Park
Mission City Memorial Park
Pruneridge Golf Course
Westwood School
SATURDAY PEAK TIME
LOS ANALYSIS LEGEND
Meets Standard
Substandard
City Boundary
School
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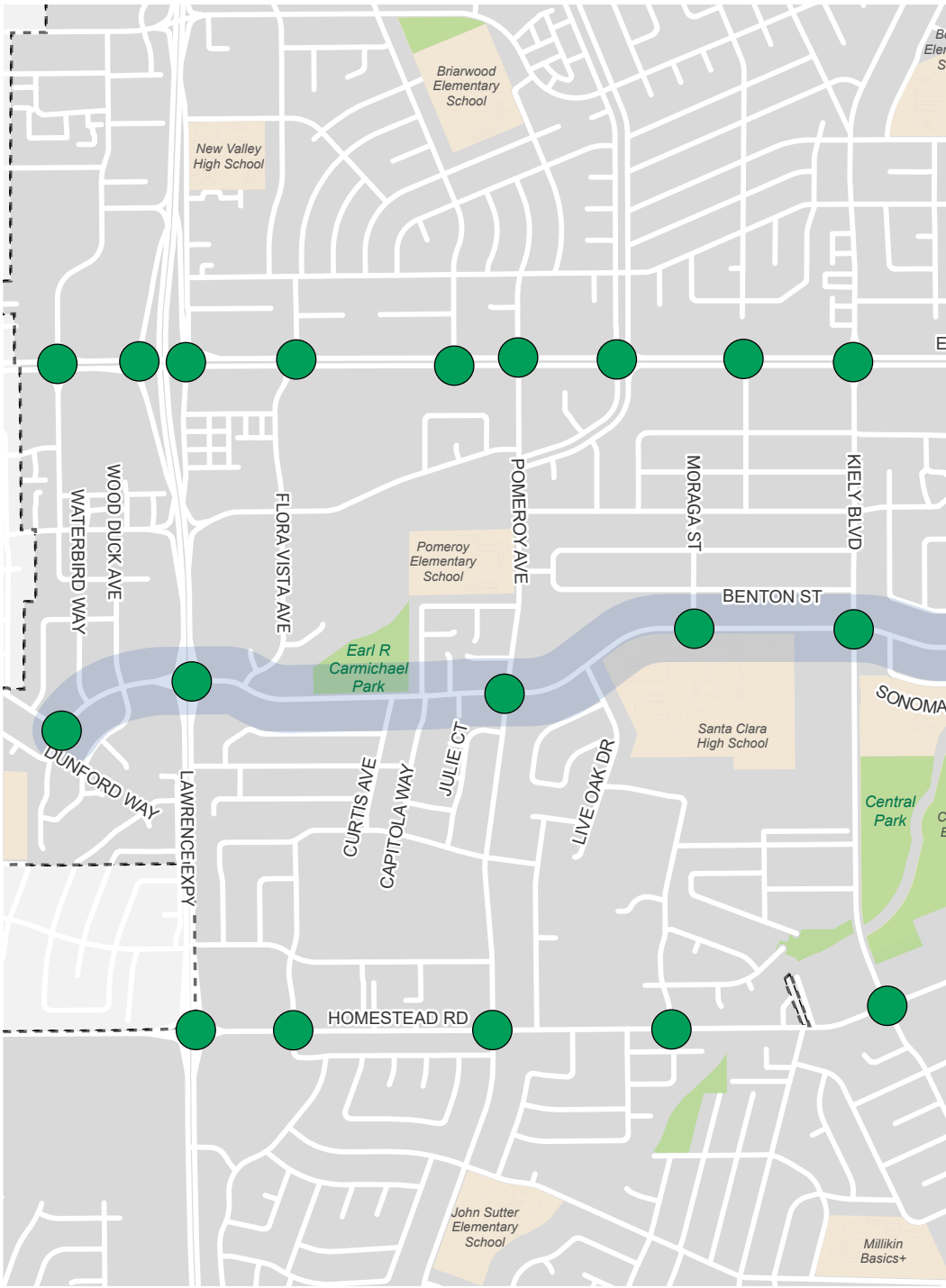
Figure 25. Level of Service Analysis for Existing Conditions and Concept A and B for Saturday peak periods



SATURDAY PEAK TIME LOS ANALYSIS FOR CONCEPT A:
TWO LANES, CENTER TURN LANE, BUFFERED BIKE LANES,
PARKING ON BOTH SIDES FOR BENTON STREET AND CONCEPT B:
TWO LANES, CENTER TURN LANE, PARKING-PROTECTED BIKE LAN

BENTON STREET

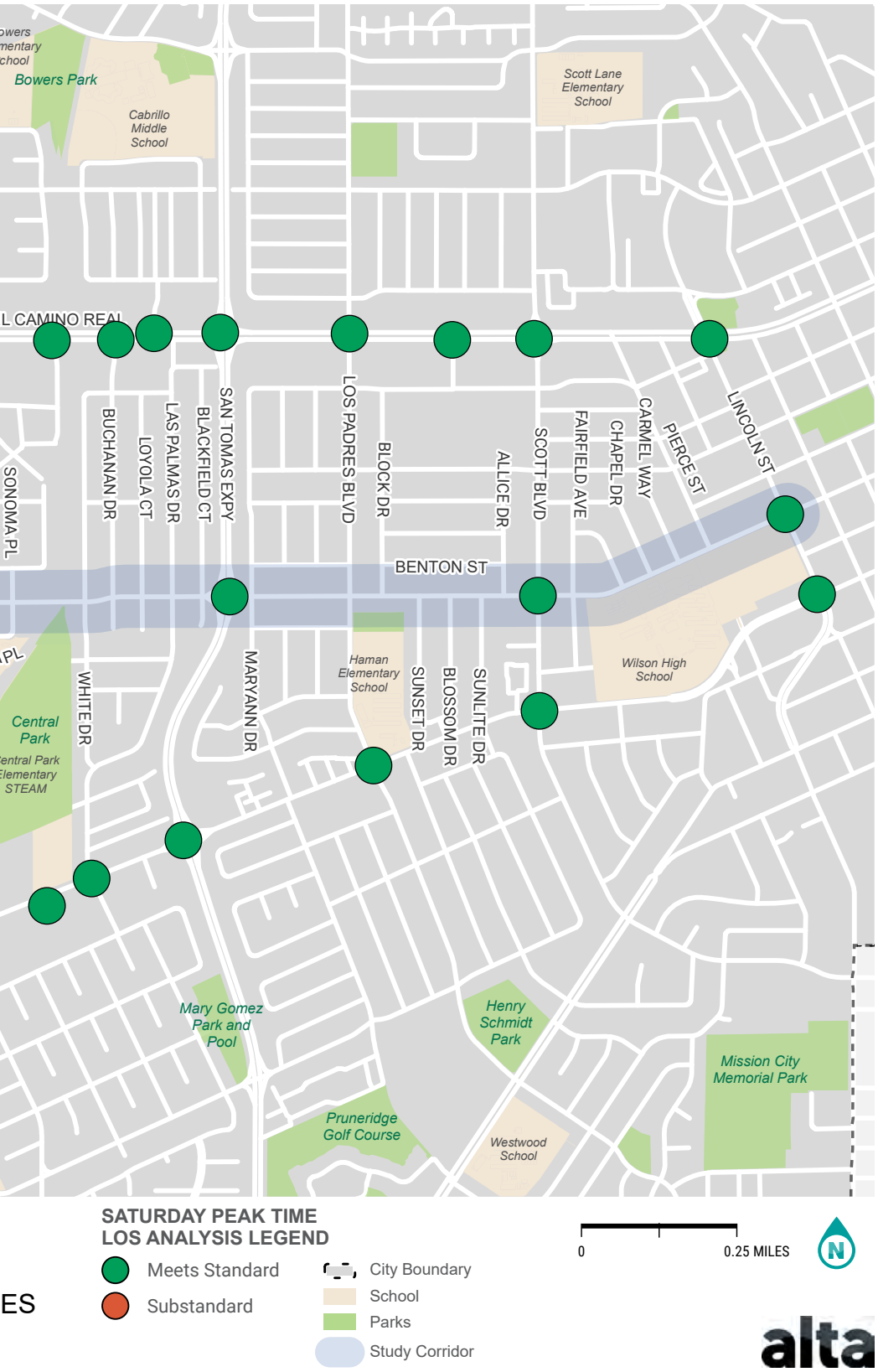

Bowers Park
Cabrillo Middle School
Scott Lane Elementary School
L CAMINO REAL
SONOMA PL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
LOS PADRES BLVD
BLOCK DR
ALLICE DR
SCOTT BLVD
FAIRFIELD AVE
CHAPEL DR
CARMEL WAY
PIERCE ST
LINCOLN ST
BENTON ST
APL
WHITE DR
Central Park
entral Park Elementary STEAM
MARYANN DR
Haman Elementary School
SUNSET DR
BLOSSOM DR
SUNLITE DR
Wilson High School
Mary Gomez Park and Pool
Henry Schmidt Park
Mission City Memorial Park
Pruneridge Golf Course
Westwood School
SATURDAY PEAK TIME
LOS ANALYSIS LEGEND
Meets Standard
Substandard
City Boundary
School
Parks
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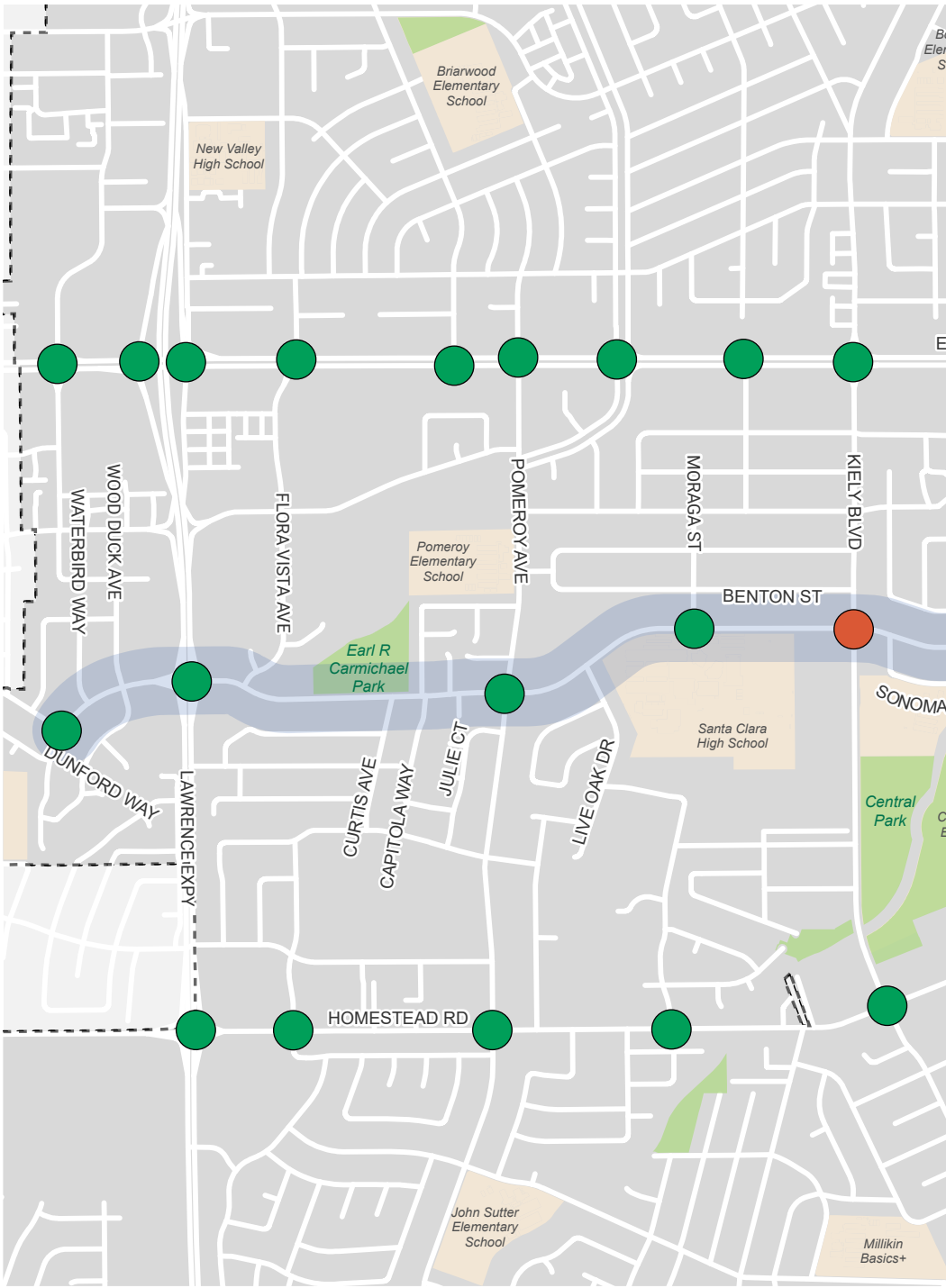
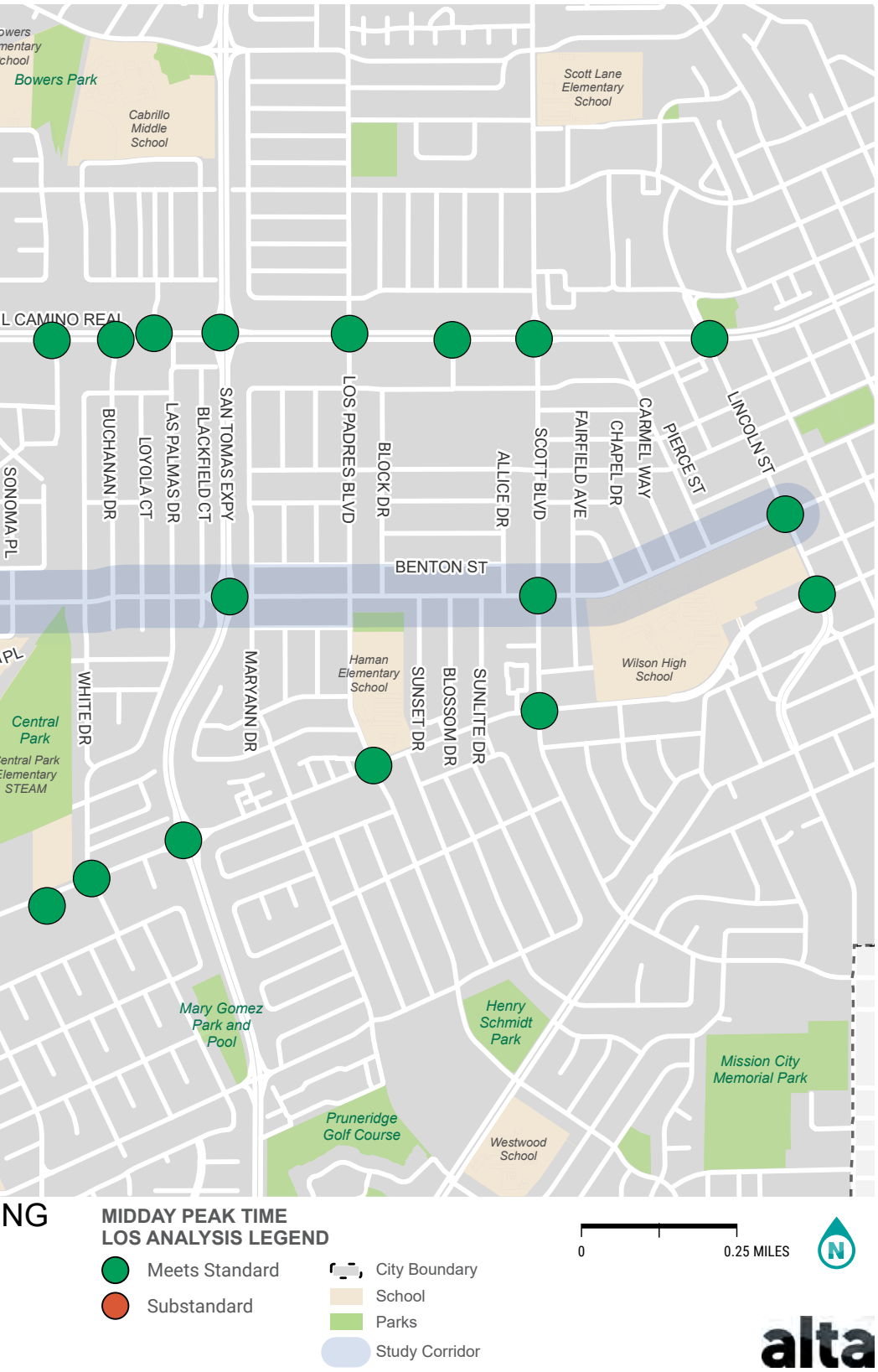
Figure 26. Level of Service Analysis for Existing Conditions and Concept C, D, E, F, and G for midday peak periods



WEEKDAY MIDDAY PEAK TIME LOS ANALYSIS FOR EXISTI
CONDITIONS AND CONCEPTS C, D, E, F, AND G

BENTON STREET



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MIDDAY PEAK TIME LOS ANALYSIS LEGEND

- Meets Standard
- Substandard
- City Boundary
- School
- Parks
- Study Corridor

0 0.25 MILES

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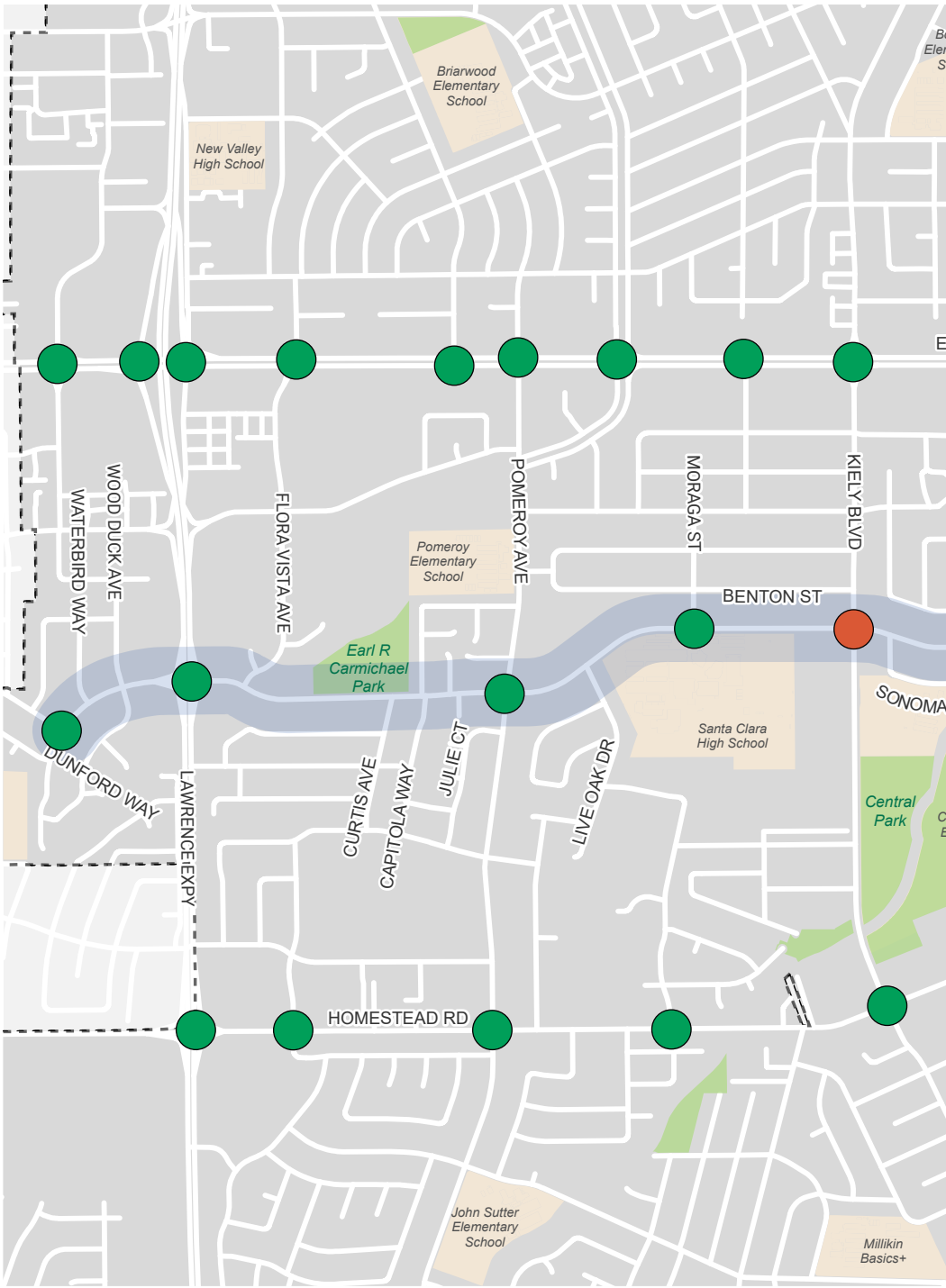
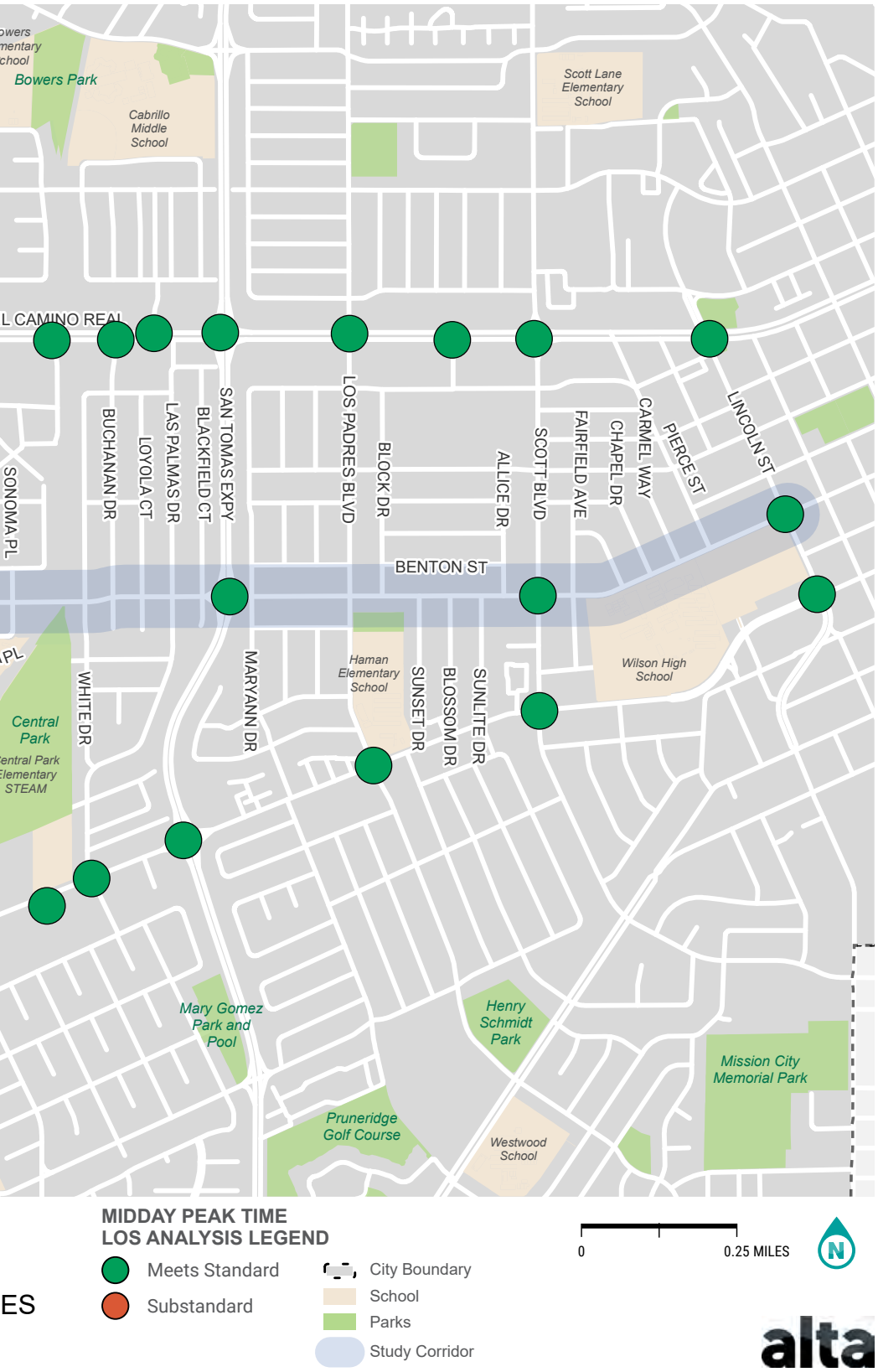
Data provided by the City of Santa Clara. Document: N:\Shared\PROJECTS\2022\00-2022-252 Santa Clara, CA Benton Street Bikeway\GIS\Process\00-2022-252-Benton St_Basemap.aprx. Date saved: 4/15/2024.

Figure 27. Level of Service Analysis for Existing Conditions and Concept A and B for midday peak periods





MIDDAY PEAK TIME LOS ANALYSIS LEGEND

- Meets Standard
- Substandard
- City Boundary
- School
- Parks
- Study Corridor

0 0.25 MILES

N

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Data provided by the City of Santa Clara. Document: N:\Shared\PROJECTS\2022\00-2022-252 Santa Clara, CA Benton Street Bikeway\GIS\Process\00-2022-252-Benton St_Basemap.aprx. Date saved: 4/15/2024.

VEHICLE MILES TRAVELED

The project team also calculated changes to vehicle miles traveled (VMT) if a bikeway were to be installed. Depending on how available and inviting alternatives to driving a personal vehicle are, people will change their behavior, shifting certain trips from driving to walking, biking, or transit. The City used the VMT Reduction Estimation methodology developed by the California Air Resources Board[1].

The City estimated that a continuous bicycle facility on the corridor will reduce VMT by 13,158 miles per year on the 64-foot-wide section between Lawrence Expressway and Maryann Drive. The City estimated that bicycle facilities on the 38-foot-wide section from Maryann Drive to Lincoln Street would reduce VMT by 3,179 miles per year.

1 For the methodology used to calculate VMT, see California Air Resources Board, Quantifying Reductions in Vehicle Miles Traveled from New Bike Paths, Lanes, and Cycle Tracks, 2019. https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdf. Seasonal adjustment factors followed the methodology in the National Bicycle and Pedestrian Documentation Project Count Adjustment Factors, 2009. https://bikepeddocumentation.org/application/files/6114/6671/7593/NBPD_Adjustment_Factors.pdf

PARKING

In addition to measuring current parking demand, the project team evaluated the impact each concept would have on parking. Concepts A, B, D, and G maintain the parking on Benton Street, so there is no anticipated change in the parking utilization rate. Concept C and Concept F both remove parking on one side to accommodate the other design features. While Concepts C and F do not indicate if parking should be removed on the north or south side, the project team analyzed the results for each. Under this analysis, the project team evaluated two scenarios.

- Scenario 1: All parking on the north side of Benton Street is removed.
- Scenario 2: All parking on the south side of Benton Street is removed.

Under each scenario, the project team assumed that drivers who typically park on the north or south side of Benton would park across the street and occupy up to 100% of typically available spaces. If there are not enough spaces available to meet the parking demand, the analysis assumes the remaining demand for parking would be met by distributing parked vehicles evenly between the two closest side streets.

Table 11. Estimated Parking Availability on Benton Street with Parking Removal Scenarios

Location	Existing/No Build and Concepts A, B, D, & G Utilization Rate	Concepts C & F Anticipated: North Side Parking Removed	Concepts C & F Anticipated: South Side Parking Removed
Benton Street North Side	70%	N/A	57%
Benton Street South Side	77%	60%	N/A
Side Streets (North Side Removed)	N/A	69%	N/A
Sides Streets (South Side Removed)	N/A	N/A	70%

NOTE: Concept E: Buffered Bike Lanes, Remove Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section would not apply to the entire corridor. The current availability rate of side streets is 74% in this section alone, and it is estimated it would be 58% with the removal of parking on both sides of Benton Street.

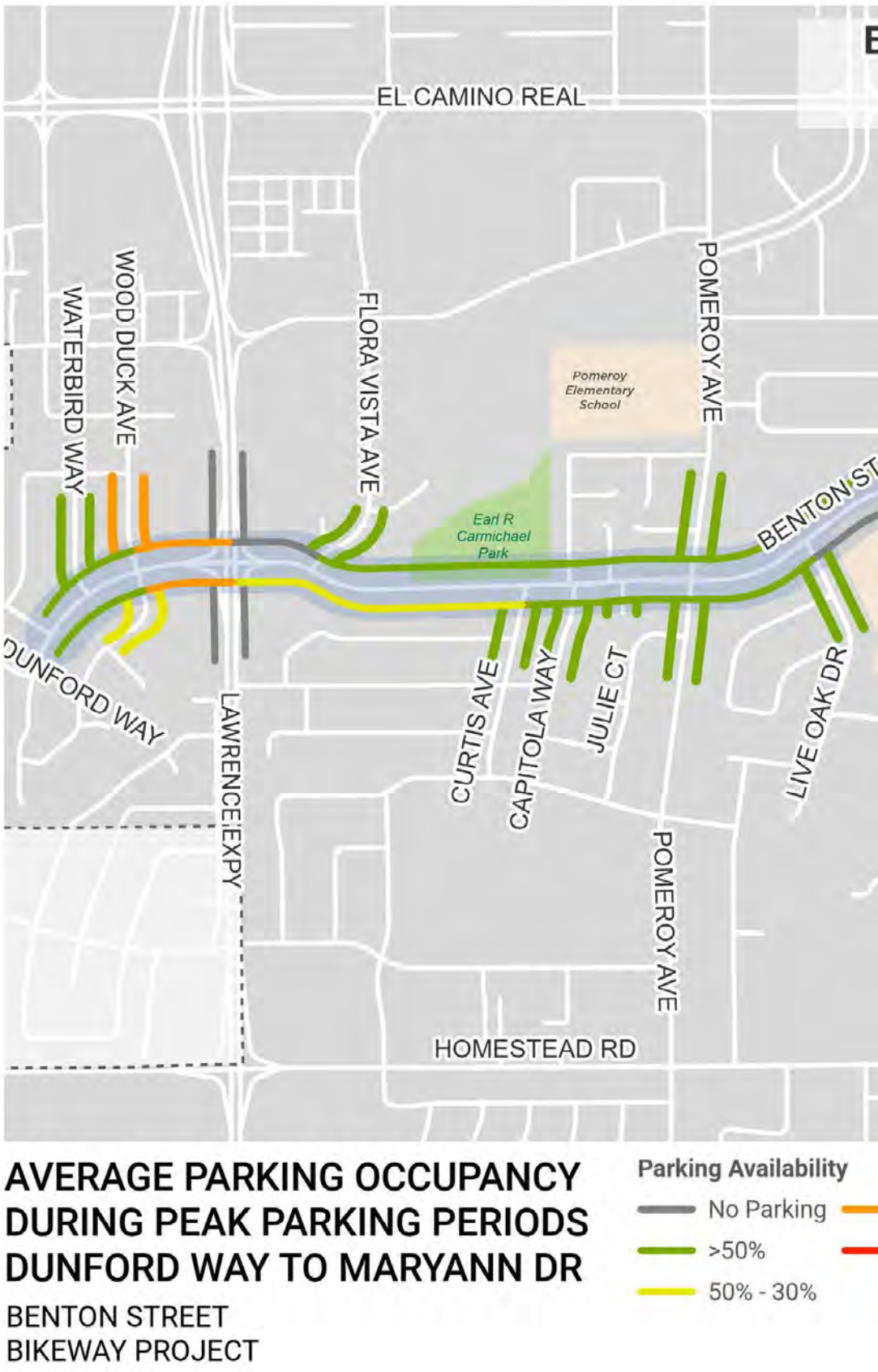
It should be noted that in Concept C, parking in front of the school needs to be removed on both sides in order to maintain the center turn lane for school traffic.

Under existing conditions, 70% of parking is available on the north side of Benton Street, and 77% is available on the south side of Benton Street. If parking were removed on the north side under Concepts C and F, parking availability would decrease on the south side from 77% to 60%. If parking were removed on the south side, parking availability would decrease on the north side from 70% to 57%.

The project team also analyzed Concept E: Buffered Bike Lanes, Remove Parking on Both Sides for Benton Street 38-Foot-Wide Typical Section, though these numbers would not apply to the entire corridor. The current availability rate of side streets along that segment of Benton Street is 74%, and it is estimated it would be 58% with the removal of parking on both sides of Benton Street.

Table 11: Estimated Parking Availability on Benton Street with Parking Removal Scenarios shows current parking utilization rates on Benton Street, which applies to Concepts A, B, D, and G where no parking is removed. The table also shows anticipated changes to average parking utilization under these concepts where parking is removed on the south side of Benton Street and on the north side of the street in front of Santa Clara High School. The available parking west of Lawrence Expressway will remain unchanged in all concepts. Maps of anticipated changes to parking utilization are shown in **Figure 28** through **Figure 33**.

Figure 28. Average Parking Occupancy During Peak Periods – 60-Foot and 64-Foot Segment



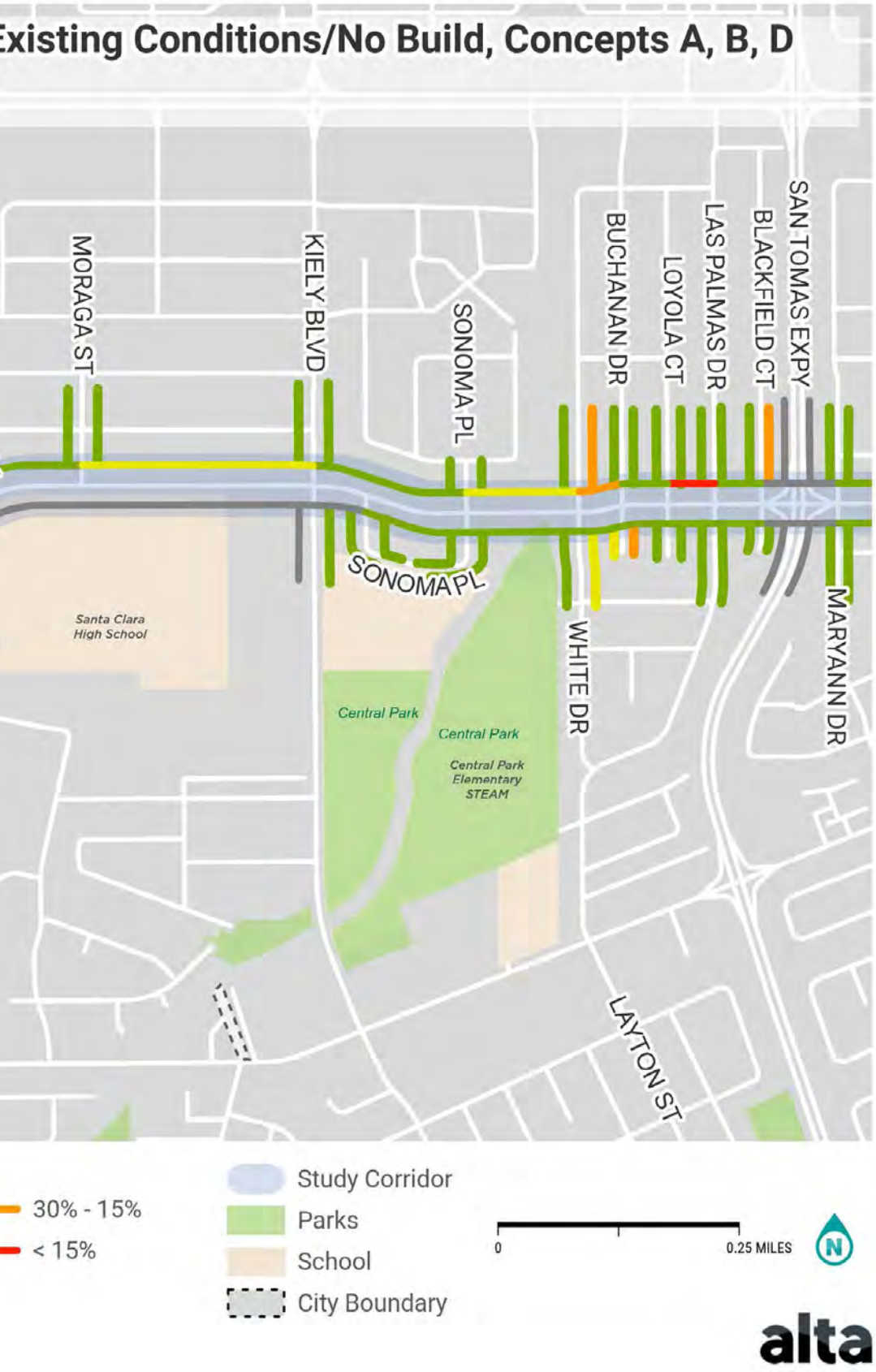
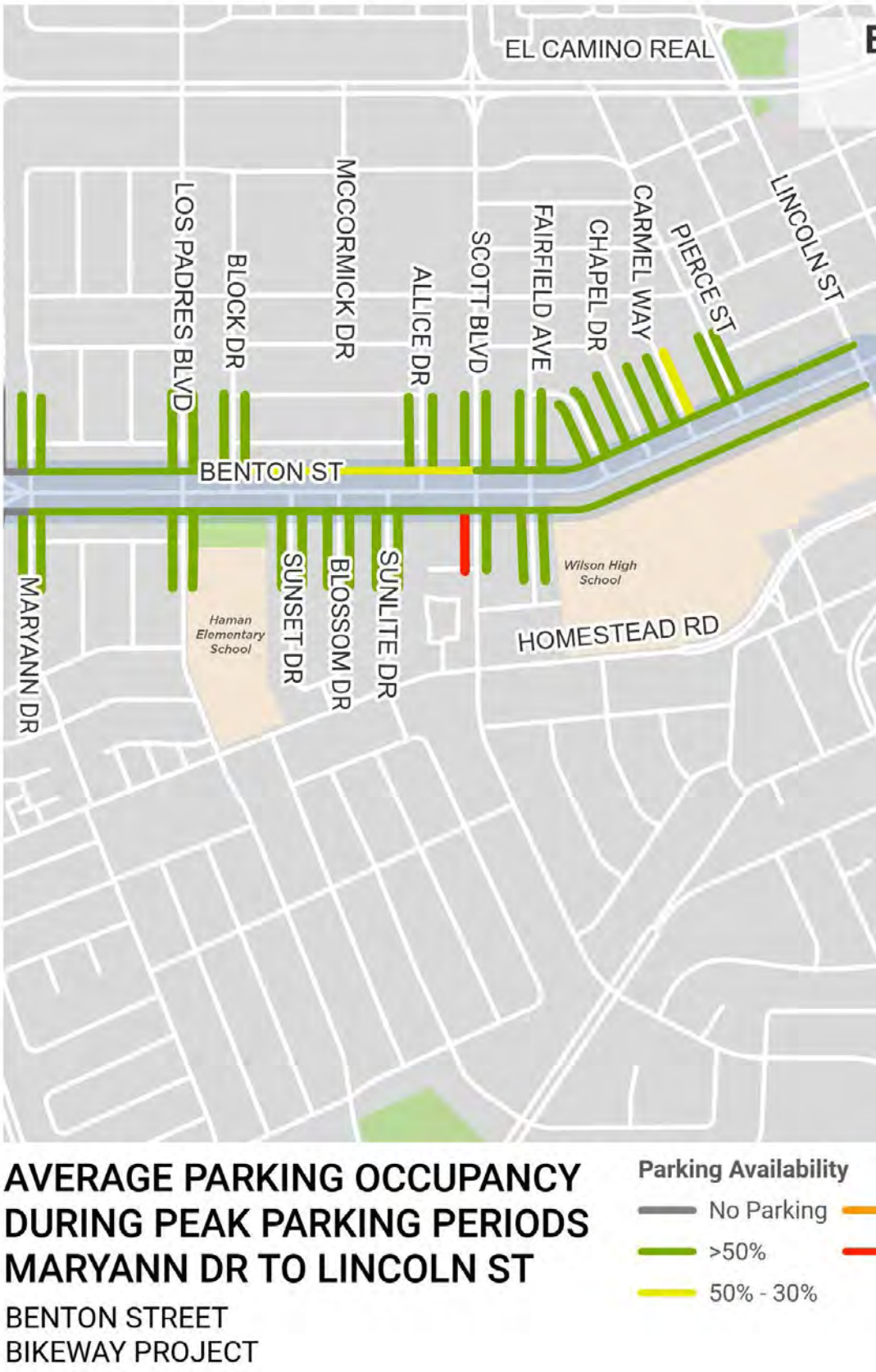

Existing Conditions/No Build, Concepts A, B, D
MORAGA ST
KIELY BLVD
SONOMA PL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
SONOMA PL
WHITE DR
MARYANN DR
LAYTON ST
Santa Clara High School
Central Park
Central Park
Central Park Elementary STEAM
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Figure 29. Average Parking Occupancy During Peak Periods – 38-Foot Segment




Existing Conditions/No Build, Concepts A, B, D
Buscher Middle School
Townsend Field
Washington Open Elementary School
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Figure 30. Average Parking Occupancy Anticipated – Benton Street North Side Parking Removed – 64-Foot Segment

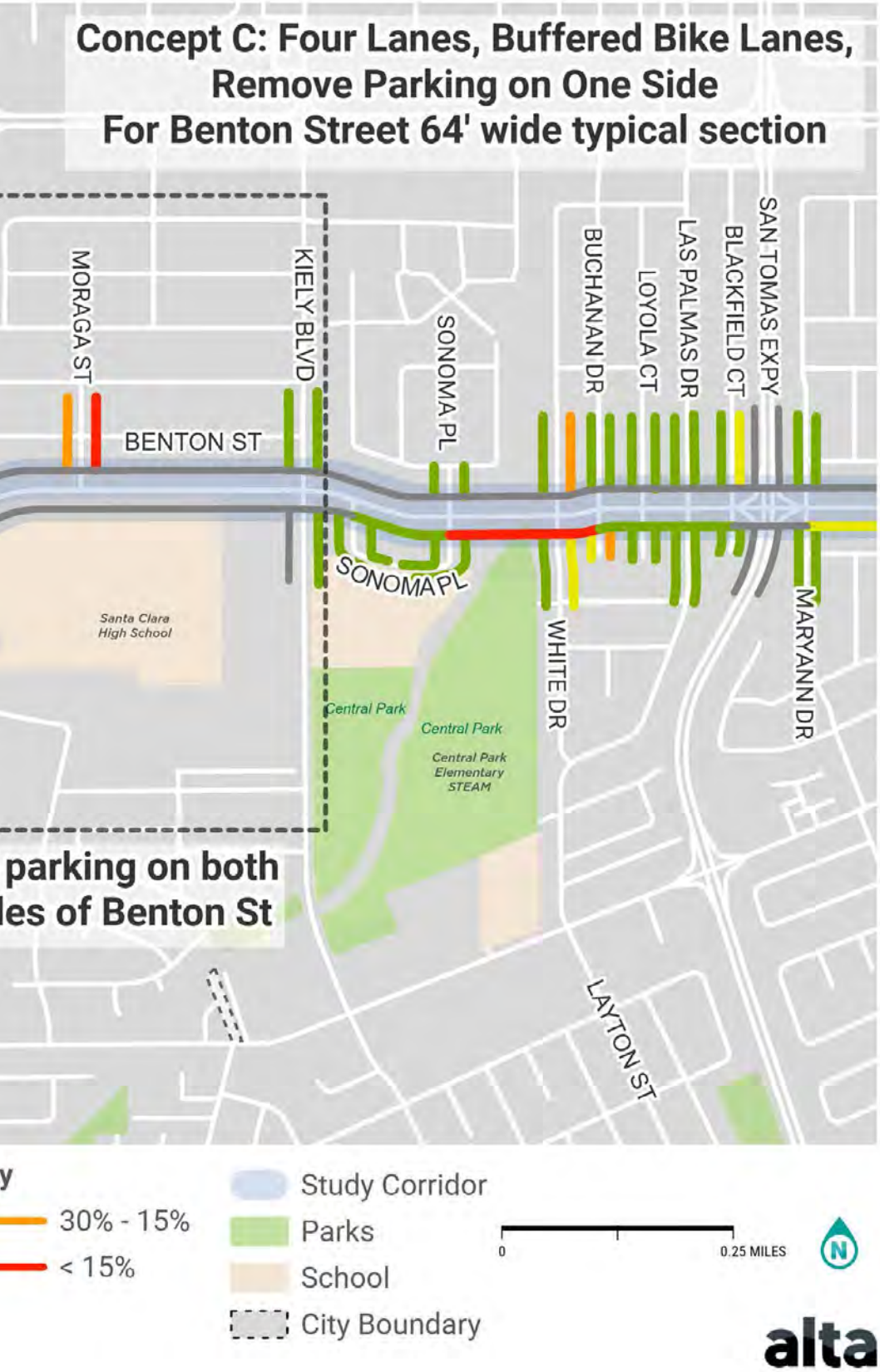

Concept C: Four Lanes, Buffered Bike Lanes,
Remove Parking on One Side
For Benton Street 64' wide typical section
MORAGA ST
KIELY BLVD
SONOMA PL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
BENTON ST
SONOMA PL
Santa Clara
High School
Central Park
Central Park
Central Park
Elementary
STEAM
WHITE DR
MARYANN DR
parking on both
les of Benton St
LAYTON ST
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Figure 31. Average Parking Occupancy Anticipated – Benton Street South Side Parking Removed – 64-Foot Segment

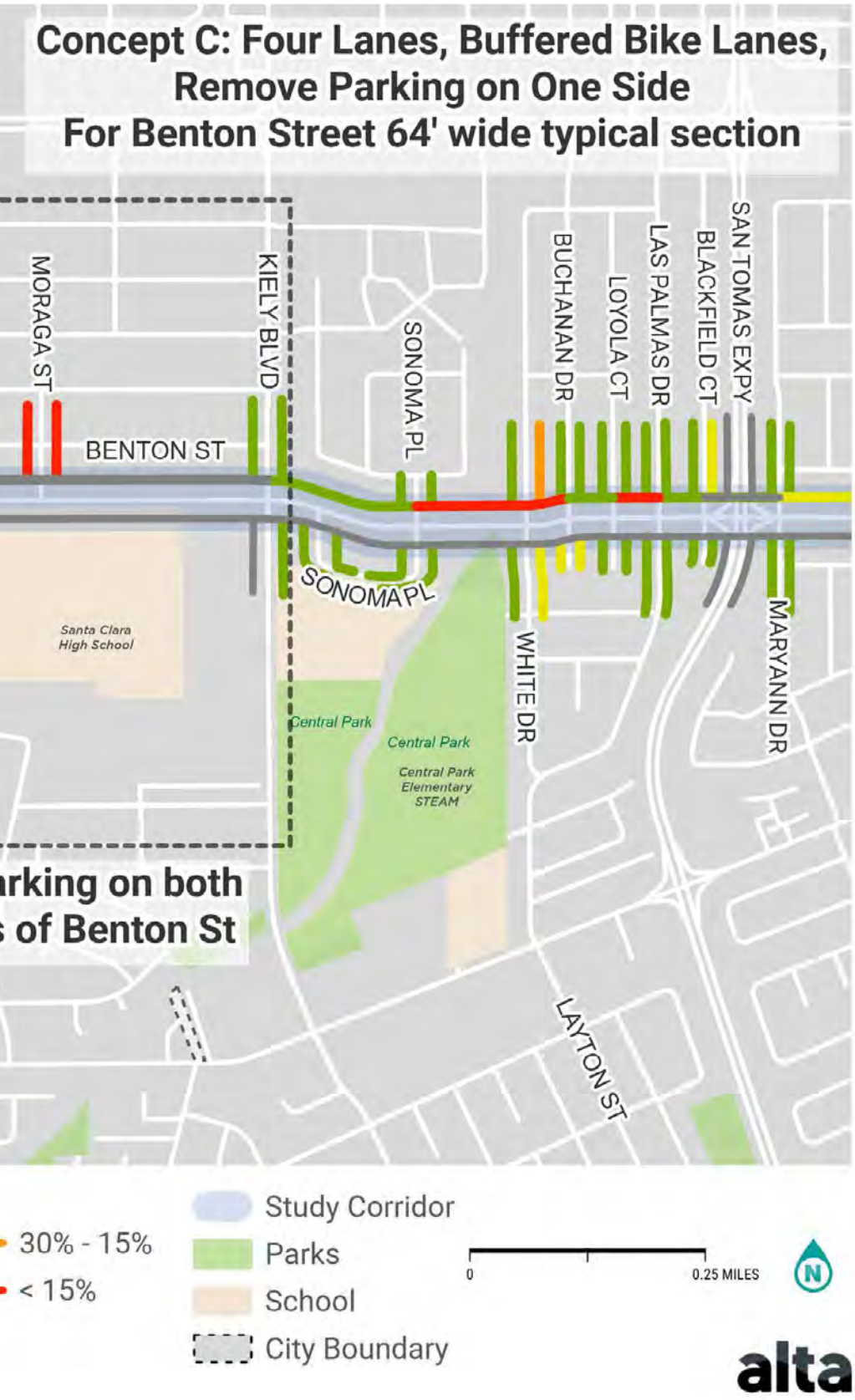
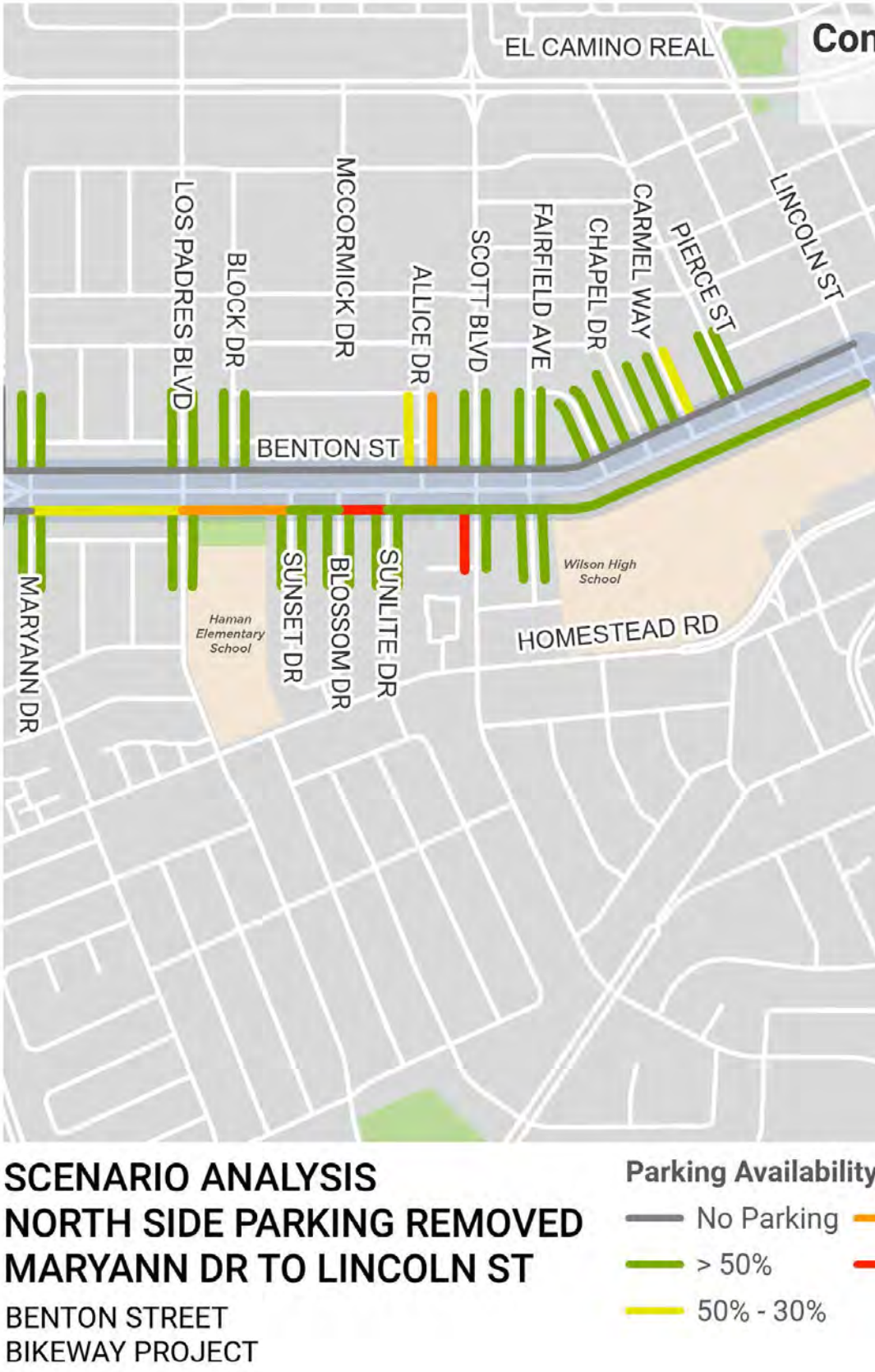
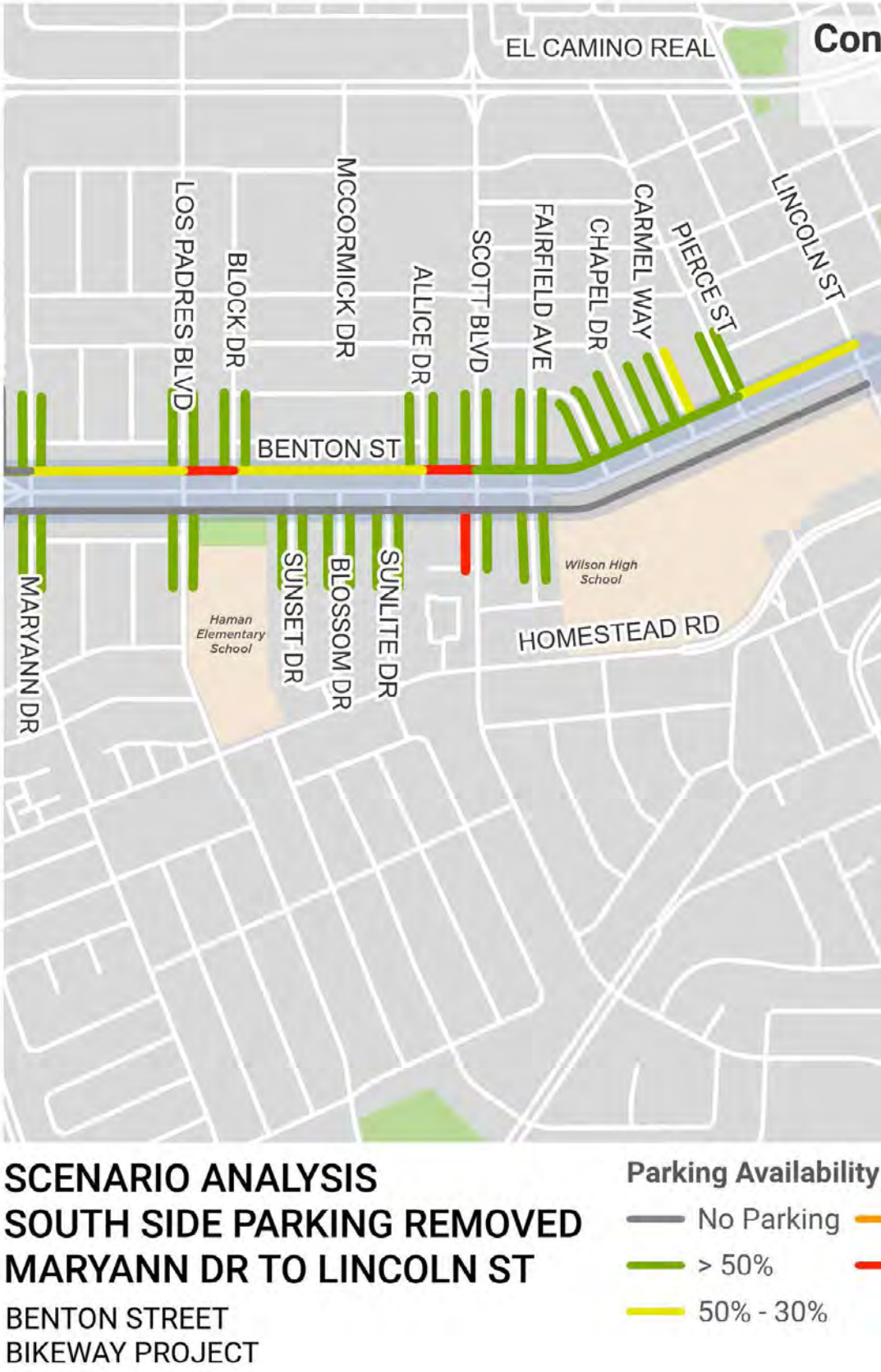

Concept C: Four Lanes, Buffered Bike Lanes,
Remove Parking on One Side
For Benton Street 64' wide typical section
MORAGA ST
KIELY BLVD
SONOMA PL
BUCHANAN DR
LOYOLA CT
LAS PALMAS DR
BLACKFIELD CT
SAN TOMAS EXPY
BENTON ST
SONOMA PL
Santa Clara High School
Central Park
Central Park
Central Park Elementary STEAM
WHITE DR
MARYANN DR
LAYTON ST
arking on both
s of Benton St
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Figure 32. Average Parking Occupancy Anticipated – Benton Street North Side Parking Removed – 38-Foot Segment




cept F: Bike Lanes, Remove Parking on One Side
For Benton Street 38' wide typical section
Buscher
Middle School
Townsend
Field
Washington Open
Elementary School
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Figure 33. Average Parking Occupancy Anticipated – Benton Street South Side Parking Removed – 38-Foot Segment




cept F: Bike Lanes, Remove Parking on One Side
For Benton Street 38' wide typical section
Buscher Middle School
Townsend Field
Washington Open Elementary School
30% - 15%
< 15%
Study Corridor
Parks
School
City Boundary
0
0.25 MILES
N
alta

Summary

Some of the many impacts for the community are summarized in **Table 12** through **Table 15**.

Table 12. Analysis Summary – 64-Foot Section

Concept	Speed Reduction	Collision Reduction Potential	Peak Travel Time* (min:sec)	Substandard Level of Service	F
Current Conditions / No Build	78% of drivers exceeded 30 mph limit	None	AM: 15:39 PM: 13:40	AM: 3 PM: 3	
Concept A - Two Lanes, Turn Lane, Buffered Bike Lanes	3-6 mph slower	Yes	AM: 23:58 PM: 21:49	AM: 3 PM: 3	
Concept B - Two Lanes, Turn Lane, Parking-Separated Bikeway	3-6 mph slower	Yes	AM: 23:58 PM: 21:49	AM: 3 PM: 3	
Concept C - Four Lanes, No Parking on One Side, Buffered Bike Lanes	1-6 mph slower	Negligible	AM: 15:39 PM: 13:40	AM: 3 PM: 3	

*Peak travel times in the AM are westbound on Benton St, and eastbound in the PM.
**For Concept C, parking would be removed from the south side, as that would have the least impact on parking supply.
SOURCES: The annual VMT reduction estimate is based on formula from California Air Resources Board, Quantifying Reductions in Vehicle Miles Traveled from New Bike Cycle Tracks https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdftechnical_041519.pdf

Table 13. Analysis Summary – 38-Foot Section

Concept	Speed Reduction	Collision Reduction Potential	Peak Travel Time* (min:sec)	Substandard Level of Service	F
Current Conditions / No Build	83% of drivers exceeded 25 mph limit	None	AM: 15:39 PM: 13:40	AM: 3 PM: 3	
Concept D - Two Vehicle Lanes, Bike Boulevard	1-6 mph slower	Negligible	AM: 23:58 PM: 21:49	AM: 3 PM: 3	
Concept E - Two Vehicle Lanes, Buffered Bike Lanes, No Parking Both Sides	1-6 mph slower	Negligible	AM: 23:58 PM: 21:49	AM: 3 PM: 3	
Concept F - Two Vehicle Lanes, Bike Lanes, No Parking One Side	1-6 mph slower	Negligible	AM: 15:39 PM: 13:40	AM: 3 PM: 3	

*Peak travel times in the AM are westbound on Benton St, and eastbound in the PM.
**For Concept F, parking would be removed from the north side, as that would have the least impact on parking supply.
SOURCES: The annual VMT reduction estimate is based on formula from California Air Resources Board, Quantifying Reductions in Vehicle Miles Traveled from New Bike Cycle Tracks https://ww2.arb.ca.gov/sites/default/files/auction-proceeds/bicycle_facilities_technical_041519.pdf

Parking Available	Annual VMT Reduction Estimate
N: 74% S: 79%	None
N: 74% S: 79%	16,337
N: 74% S: 79%	16,337
N: 64%**	16,337

Paths, Lanes, and

Parking Available	Annual VMT Reduction Estimate
N: 68% S: 82%	None
N: 68% S: 82%	16,337
No parking on both side	16,337
S: 64%**	16,337

Paths, Lanes, and

Table 14. Benefits Summary – 64-Foot Section

	Current Conditions / No Build		Conce
	Yes	No	
Benefits for People Riding Bicycles			
Adds a bicycle facility		●	
Provides physical separation between traffic and bicyclists		●	
Encourages bicyclists to not ride on sidewalks		●	
Provides consistent clear visibility of bicyclists		●	
Allows bicyclists to maneuver around debris	●		
Allows bicyclists to make mid-block turns	●		
Benefits for People Driving Vehicles			
Maximizes roadway and intersection capacity	●		
Potential to significantly reduce vehicle collisions		●	
Adds a turn lane for safer turning maneuvers		●	
Benefits for Community & Residents			
Reduces VMT		●	
Maintains existing on-street parking capacity	●		
Encourages slower automobile speeds		●	
Incorporates traffic calming measures		●	
Does not increase pedestrian mid-block crossing demand	●		
Maintains existing residential trash collection plan*	●		
Allows residents to participate in Annual Cleanup Campaign	●		
Does not require construction funding	●		

** For detailed discussion of trash collection, see page 63*

ept A - Two Lanes, Turn Lane, Buffered Bike Lanes		Concept B - Two Lanes, Turn Lane, Parking-Separated Bikeway		Concept C - Four Lanes, No Parking on One Side, Buffered Bike Lanes	
Yes	No	Yes	No	Yes	No
●		●		●	
	●	●			●
●		●		●	
●			●	●	
●			●	●	
●			●	●	
	●		●	●	
●		●			●
●		●			●
●		●		●	
●		●			●
●		●			●
●		●			●
●		●			●
●			●		●
●			●		●
	●		●		●

Table 15. Benefits Summary – 38-Foot Section

	Current Conditions / No Build		Con
	Yes	No	
Benefits for People Riding Bicycles			
Adds a bicycle facility		●	
Encourages bicyclists to not ride on sidewalks		●	
Provides consistent clear visibility of bicyclists		●	
Allows bicyclists to maneuver around debris	●		
Benefits for Community & Residents			
Reduces VMT		●	
Maintains existing on-street parking capacity	●		
Encourages slower automobile speeds		●	
Incorporates traffic calming measures		●	
Does not increase pedestrian mid-block crossing demand	●		
Maintains existing residential trash collection plan*	●		
Allows residents to participate in Annual Cleanup Campaign	●		
Does not require construction funding	●		

** For detailed discussion of trash collection, see page 63*

cept D - Two Vehicle Lanes, Bike Boulevard		Concept E - Two Vehicle Lanes, Buffered Bike Lanes, No Parking Both Sides		Concept F - Two Vehicle Lanes, Bike Lanes, No Parking One Side	
Yes	No	Yes	No	Yes	No
●		●		●	
●		●		●	
	●	●		●	
●		●			●
●		●		●	
●			●		●
●		●		●	
●			●		●
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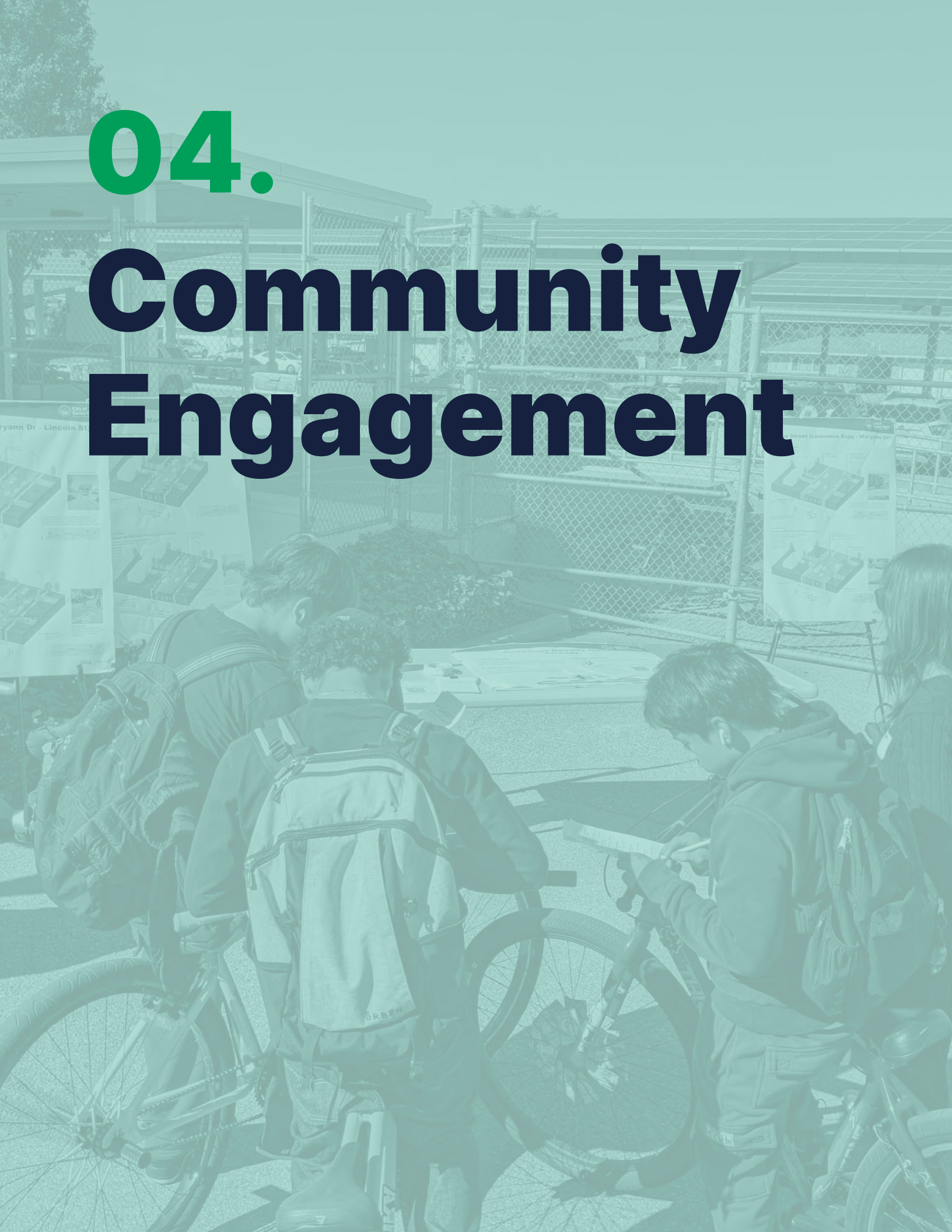
●			●		●
●			●		●
	●		●		●

04.
Community Engagement



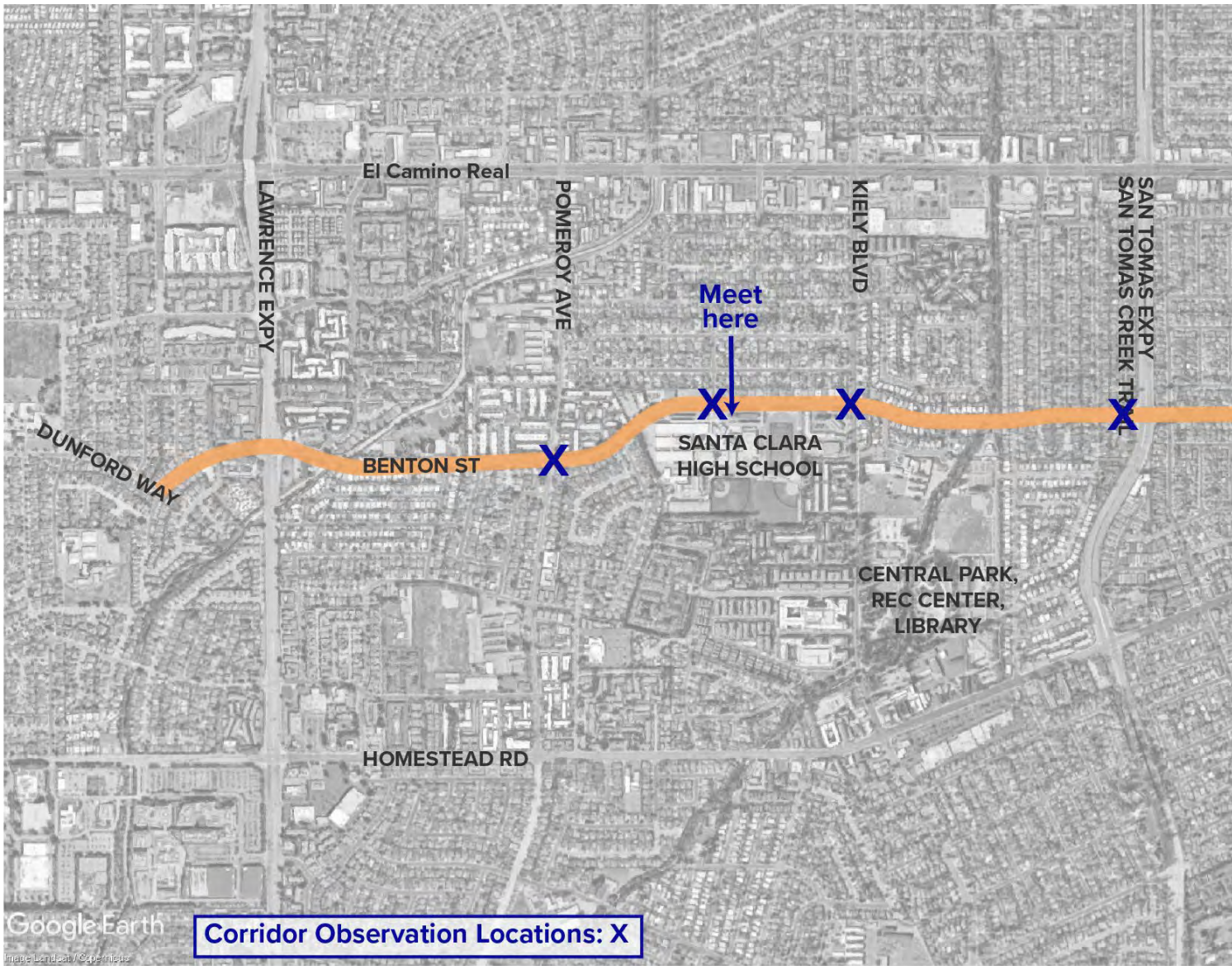
Engagement Strategies

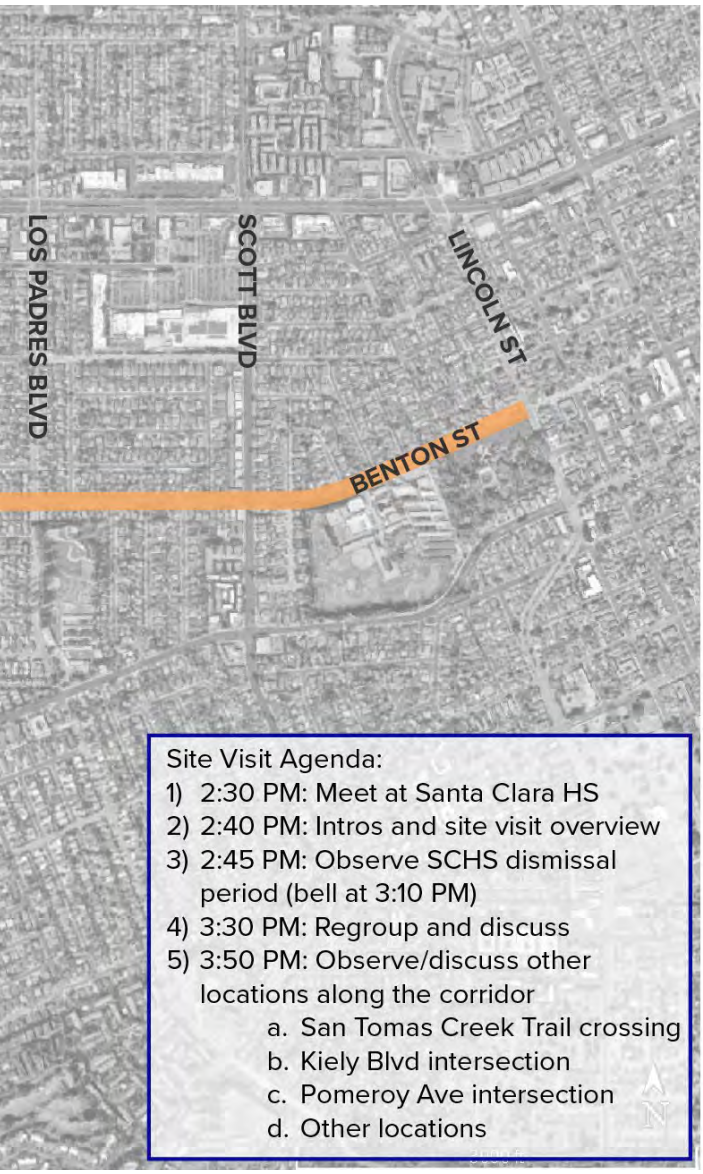
Project Website, Hotline, and Email

City staff hosted and maintained a website on the Public Works Department page to promote engagement events, provide educational materials, document meetings, and provide a forum for the community to submit comments. Project staff also provided a phone number hotline as an accessible alternative for community members to leave project feedback, as well as an email address to submit comments. The project email account regularly sent updates to everyone who had signed up for project notifications whenever new information or materials were added to the project website, including meeting and survey details.

Person biking at Benton Street and Live Oak Drive (above) and students crossing Benton Street after school from SCHS (below).

Figure 34. Site Visit Agenda and Observation Locations





Site Visit

Participants from the City of Santa Clara Bicycle and Pedestrian Advisory Committee (BPAC), City of Santa Clara staff, and the project team made a site visit on May 10, 2023, to observe conditions and behaviors, particularly around the afternoon release at SCHS. A map and schedule for observations is shown in **Figure 34**.

Committee/Commission Meetings

BICYCLE AND PEDESTRIAN ADVISORY COMMITTEE

City staff met with the BPAC on four different occasions to provide updates and solicit input at major milestones:

Meeting 1: Plan overview, schedule, and BPAC priorities (March 27, 2023)

Meeting 2: Review and collect feedback on draft corridor concepts (August 28, 2023)

Meeting 3: Review analysis results and provide feedback on draft concepts (January 22, 2024)

Meeting 4: Approve final report and recommend preferred design concept to the City Council (Anticipated June 2024)

SENIOR ADVISORY COMMISSION

The project team met with the Senior Advisory Commission on September 25, 2023 during Phase 2 of the project to inform commissioners and members of the public about the project and collect feedback on the proposed bikeways and general project input. The project team also provided project timelines and ways commissioners can stay involved with the project.

PARKS AND RECREATION COMMISSION

The project team met with the Parks and Recreation Commission on September 19, 2023 during Phase 2 of the project to inform commissioners and members of the public about the project and collect feedback on the proposed bikeways and general project input. The project team also provided project timelines and ways commissioners can stay involved with the project.

YOUTH COMMISSION

The project team met with the Youth Commission on September 12, 2023 during Phase 2 of the project to inform commissioners about the project and collect feedback on the proposed bikeways and general project input. The project team also provided project timelines and ways commissioners can stay involved with the project.

Community Workshops

The project team hosted five community workshops online for the public to learn more about the project and provide feedback. The City advertised the workshops on its website and social media channels and mailed postcards to all addresses within a half-mile of the Benton Street project corridor (1,000 postcards). Each postcard indicated the project includes the potential to add bicycle lanes with the removal of on-street parking or travel lanes.

Additionally, the team created and produced 10 roadway signs with project information and placed them along the corridor early during Phase 1 engagement. Signs remained along the corridor for the duration of the project.

Phase 1:

- Community Workshop #1: May 16, 2023
- Community Workshop #2: May 20, 2023

Phase 2:

- Community Workshop #3: September 13, 2023
- Community Workshop #4: September 23, 2023

Phase 3:

- Community Workshop #5: January 24, 2024

Pop-Up Events

The project team held pop-up events at six locations to meet residents, students, and community members and engage them on the project. Each of the pop-up events, except for the Santa Clara High School Outreach event, included three other separate bikeway studies on Monroe Street, Walsh Avenue/Martin Avenue, and Coleman Avenue/De La Cruz Boulevard.

EARTH DAY/ARBOR DAY

At the Earth Day / Arbor Day event held at Central Park on April 27, 2023, from 10:00 a.m. to 2:00 p.m., the project team introduced the four corridor studies, including the Benton project, to the public. A map of the study corridors with a QR code that linked to the project webpages was displayed. Overall, four members of the public signed up for project updates through email contact.

BIKE TO WORK DAY

The City partnered with Silicon Valley Power to co-host an energizer station and pop-up event along the San Tomas Aquino Creek Trail on Bike to Work Day, Thursday, May 18, 2023, between 7:00 and 10:00 a.m. The pop-up was at a trailhead near the Agnew Road intersection. This event featured representation from all four of the City's corridor planning projects. Overall, the staff gathered feedback from over 30 community members.

SANTA CLARA ART AND WINE FESTIVAL

On September 16 and 17, 2023, at Central Park, the project team had a booth set up with concept display boards, paper surveys, and QR codes for the project website and survey. Over 400 community members engaged with staff on the project.

SANTA CLARA HIGH SCHOOL OUTREACH

The project team set up a booth outside the gym and bike racks at SCHS during afternoon dismissal on October 26, 2023, with concept display boards, paper surveys, and QR codes for the project website and survey. Approximately 30 students provided comments, and 26 people from the school community completed a survey. In addition, the City worked with SCHS students to publish an article about the project in The Roar student newspaper in October.

HOLIDAY TREE LIGHTING EVENT

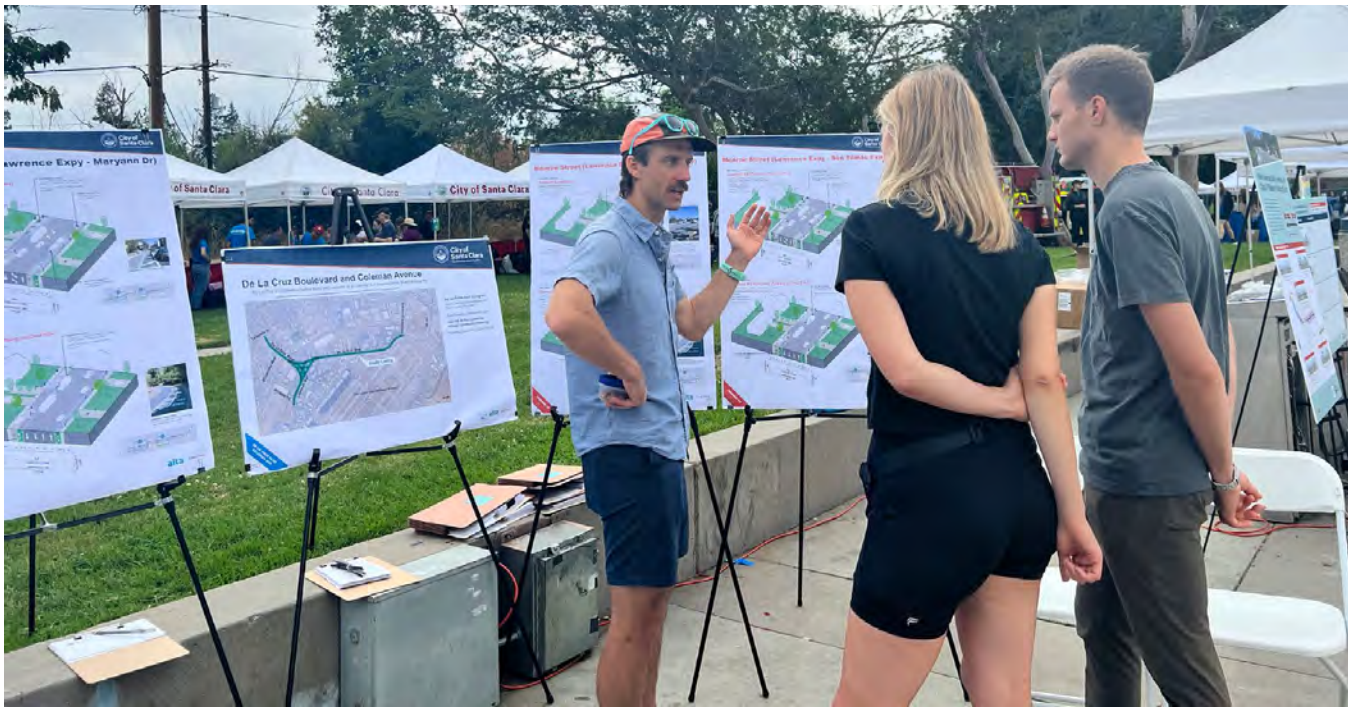
The project team also attended the Holiday Tree Lighting Ceremony on December 1, 2023, where a similar booth was set up for broader community members to engage with staff on the project, with concept display boards, comment cards, and QR codes for the project website and survey. Staff collected 20 comment cards.

CALTRAIN COMMUTER OUTREACH

On Thursday, February 15, 2024, from 4:00 to 6:00 p.m., the project team set up a pop-up event at the Santa Clara Caltrain station, with concept display boards, maps, and QR codes for the project website and survey. Around a dozen community members engaged with staff directly.

Online Surveys

The project team conducted three public surveys throughout the project period, and posted all three to the project website. The first was a brief survey that included questions on transportation preferences and behaviors, specific questions about how attendees use Benton Street, and demographic questions. The second survey gathered feedback and preferences on draft corridor concepts, while the third survey asked for ranked preferences on corridor concepts after revisions.



Community members participate in events at Santa Clara Art and Wine Festival (top), Bike to Work Day (lower left), and Santa Clara High School (lower right).

Community members participate in events at Holiday Tree Lighting Ceremony (above) and Caltrain Commuter outreach (left).

Phase 1 Engagement Summary Findings

The Benton Street Bikeway Study included multiple community engagement opportunities during its first phase, including two virtual community workshops, pop-up events on Earth Day/Arbor Day and Bike to Work Day, online community survey, project email address and voicemail number, and one BPAC meeting.

At the virtual community workshops, participants described their current experiences traveling on Benton Street. Sample comments included that biking does not feel safe, traffic backups can sometimes be an issue, and Santa Clara High School generates a lot of walking and biking trips in the area. Community members shared that their goals for Benton Street centered around having a functional multimodal street that provided safe and friendly bicycle options while respecting the driveway access needs of local residents. Attendees also shared that safe bike facilities that provided physical separation from vehicles would encourage them to bike more. Workshop recordings are available on the project website for review.

At the Bike to Work Day event, staff gathered feedback from over 30 community members and engaged many more on the project. Several common comment themes emerged. Multiple people stated that while they did not ride on Benton Street, they cross it frequently, and many crossings are uncomfortable for people biking. The San Tomas Expressway crossing came up multiple times as feeling uncomfortable. This connection is essential as it connects people to Central Park, the library, and other community destinations.

Some community members also stated that most San Tomas Aquino Creek Trail crossings are at major roads and feel uncomfortable, including Benton Street. Many residents appreciated the intent to add buffered bike lanes, especially seeing the benefit it would have for high school students and staff. Some thought separated facilities would do a better job of keeping cars out of the bike lane, which could be a problem in front of the high school.

The first Benton Street survey received 114 responses. The survey asked about community members' travel preferences, current thoughts on the state of the corridor, and their ideas for the future. Over half (54%) of survey respondents reported walking along the corridor at least once a week, 45% indicated that they bike along the corridor at least once per week, and around 80% of respondents indicated that they also drive the

Community members stop to discuss bikeway concepts on Bike to Work Day.

corridor at least once a week. Over half (52%) of respondents indicated that they either agree or strongly agree that they can usually find parking near their destination, while 42% gave a neutral response. Only 7% indicated they disagree or strongly disagree that they can usually find parking near their destination. Regarding traffic congestion, 45% of respondents agreed that traffic generally flows well on Benton Street; only about one-quarter of respondents (27%) disagreed or strongly disagreed.

The survey asked respondents about what factors influence their transportation decision-making. About 62% of respondents indicated that "riding a bicycle or other rolling device does not feel safe" as a factor in their decision-making. This was the only option selected by over half of the respondents and one of two options to get picked by over one-third of respondents. The second-highest factor was "crossing the street is uncomfortable or doesn't feel safe," with 35% of respondents selecting this option. A full summary of responses is shown in **Appendix B**. When asked which biking and walking improvements would improve their overall experience on Benton, these were top three responses:

- Add/enhance bicycle lanes along the roadway.
- Improve bicyclists' safety at intersections along Benton Street.
- Add/enhance pedestrian crosswalks.

Finally, the Benton Street email and voicemail accounts received 11 comments during this first phase. Community member feedback centered around concerns about current traffic congestion, improving pedestrian crossings (and intersections generally), and concerns about potential parking removal.

Across all Phase 1 engagement events, four common themes emerged:

- Bicycle facilities should feel safe and comfortable, especially for high school students.
- Crossing Benton Street is not comfortable on a bicycle.
- Improved connections to and crossings of the San Tomas Aquino Creek Trail can enhance connections to multiple destinations.
- The street redesign should consider and balance the traffic congestion and parking needs and expectations of nearby local residents.

Phase 2 Engagement Summary Findings

The second phase of engagement included two virtual community workshops; two pop-up events at the Art and Wine Festival and at SCHS; and meetings with the Youth Commission, Senior Advisory Commission, Parks and Recreation Commission, and BPAC. This is all in addition to a second online design alternatives survey and continued use of the project email address and voicemail number.

The project team hosted two virtual community workshops for the project on the evening of Wednesday, September 13, 2023, and on Saturday, September 23, 2023. The team advertised the workshops on the City's website and mailed postcards to all addresses within a half-mile of the Benton Street project corridor (1,000 postcards). Both workshops covered the same content. Wednesday's workshop had eight attendees, and Saturday's workshop had two. The presentations included interactive polling from Mentimeter and a question-and-answer session at the end of the formal presentation. Project staff presented a project overview, corridor parking and collision analysis, and alternative concept designs. Workshop recordings are available on the project website for review.

When asked about design alternatives presented, participants expressed concerns about high-speed traffic and getting doored by people exiting parked vehicles. Participants described a desire for sidewalk-level facilities as well as thoughtful design around intersections and driveways. Attendees also shared that safe bike facilities with physical barriers between the bikeway and traffic would encourage them to bike more.

The second online survey was posted on August 28, 2023, and ran until October 31, 2023, and received 258 public responses. Of these, at least 60% travel along or cross the corridor regularly, and at least 49% live on or near it. Respondents were asked to review each concept and indicate if they fully supported, supported with minor modifications, needed major changes to get support, or did not support the concept. Results of the survey are shown in **Table 16: Online Survey #2 Results – All Responses (258 responses)**. Specific results from people affiliated with SCHS are shown in **Table 17: Online Survey #2 Results – Santa Clara High School (26 responses)**. SCHS respondents wrote that having bike lanes "will make it much easier to get to and from school" and will provide "overall improved road safety for all road users," and supported bike lane installation. Concept G: Two Lanes, Buffered Bike Lanes, Parking on Both Sides for Benton Street from Dunford Way to Lawrence Expressway was not included in this survey, as this design would not reduce travel lanes, turning lanes, or parking, but rather uses outsized width reduction to introduce bicycle lanes in a 60-foot-wide typical section.

For the Benton Street 64-foot-wide typical section, over 60% of respondents supported the lane removal concepts: either Concept A with Buffered Bike Lanes or Concept B with Parking-Separated Bikeway. Concept C has support from 46% of respondents. All three concepts received majority support from the SCHS respondents. For those who indicated "support with minor changes" in Concept A, common comments

Community members engaging with the project team at the Art and Wine Festival (left) and students actively participating at SCHS (right).

included adding physical separation of bike lanes from traffic, adding crosswalks, and concern about traffic congestion. In Concept B, common comments included infringement in bike lane by parked cars, trash bins, and driveway visibility. In Concept C, common comments included mid-block pedestrian crossing, adding physical separation of bike lanes from traffic, and desire for a central turning lane.

For the Benton Street 38-foot-wide typical section, Concept E: Buffered Bike Lanes, Remove Parking on Both Sides received the highest support with 59% respondents. SCHS respondents support both Concept E and Concept F, which propose parking removal. For Concept D: Bicycle Boulevard, over half of the respondents indicated they do not support the concept.

For those who indicated "support with minor changes" in Concept D, common comments included a need for traffic calming infrastructure and bikeways that don't require sharing space with vehicles. In Concept E, common comments included desire for parking and for protective barriers between people riding bicycles and people driving. In Concept F, common comments included a need for a buffer or barrier between cars and the bikeway, as well as parking concerns.

Table 16. Online Survey #2 Results – All Responses (258 responses)

Response	64-Foot Concept A	64-Foot Concept B	64-Foot Concept C
	Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides	Two Lanes, Center Turn Lane, Parking-Separated Bikeway	Four Lanes, Buffered Bike Lanes, Remove Parking on One Side
Fully support	39.4%	45.4%	23.0%
Support with minor changes	20.2%	17.3%	12.6%
Needs major changes to get my support	11.7%	7.6%	21.9%
I do not support this concept	28.7%	29.7%	42.6%

Response	38-Foot Concept D	38-Foot Concept E	38-Foot Concept F
	Bicycle Boulevard, Parking on Both Sides	Buffered Bike Lanes, Remove Parking on Both Sides	Bike Lanes, Remove Parking on One Side
Fully support	20.6%	38.0%	31.3%
Support with minor changes	10.9%	19.0%	27.6%
Needs major changes to get my support	16.4%	8.0%	10.4%
I do not support this concept	52.1%	35.0%	30.7%

Table 17. Online Survey #2 Results – Santa Clara High School (26 responses)

Response	64-Foot Concept A	64-Foot Concept B	64-Foot Concept C
	Two Lanes, Center Turn Lane, Buffered Bike Lanes, Parking on Both Sides	Two Lanes, Center Turn Lane, Parking-Separated Bikeway	Four Lanes, Buffered Bike Lanes, Remove Parking on One Side
Fully support	50.0%	50.0%	88.9%
Support with minor changes	40.0%	50.0%	11.1%
Needs major changes to get my support	10.0%	0.0%	0.0%
I do not support this concept	0.0%	0.0%	0.0%

Response	38-Foot Concept D	38-Foot Concept E	38-Foot Concept F
	Bicycle Boulevard, Parking on Both Sides	Buffered Bike Lanes, Remove Parking on Both Sides	Bike Lanes, Remove Parking on One Side
Fully support	16.7%	50.0%	50.0%
Support with minor changes	50.0%	50.0%	50.0%
Needs major changes to get my support	0.0%	0.0%	0.0%
I do not support this concept	33.3%	0.0%	0.0%

Phase 3 Engagement Summary Findings

The third and final phase of engagement for this project included one virtual community workshop; two pop-up events with the Santa Clara Tree Lighting Ceremony and at the Caltrain station; and a meeting with BPAC. This was all augmented with a third ranked choice survey and continued use of the project email address and voicemail number.

The project team hosted one virtual community workshop for the project on the evening of Wednesday, January 24, 2024. The team advertised the workshop on the City's website and mailed postcards to all addresses within a half-mile of the Benton Street project corridor (1,000 postcards). Eight people attended the workshop. The presentation included a project overview, corridor parking and collision analysis, alternative concept designs, and a question-and-answer session at the end.

The project team ran the third online survey from January 16, 2024, until February 25, 2024. The survey received 116 public responses, and a decision on the preferred alternative will include input from all members of the community. Approximately 27% of respondents live or work on Benton Street, and the majority travel or cross the corridor regularly (**Figure 35**). The project team used ranked choice voting to determine which alternative had majority support from the public. If no candidate had an outright majority, the team eliminated the recipient with the fewest first-choice votes. Those who voted for the eliminated candidate had their votes redistributed to their next highest ranked choice in the following round. Concept G: Two Lanes, Buffered Bike Lanes, Parking on Both Sides for Benton Street from Dunford Way to Lawrence Expressway won for the 60-foot-wide typical section with an outright majority (84%) of all 1st choice votes.

After the ranked choice analyses, on a 64-foot-wide typical section, the winner was Concept B: Two Lanes, Center Turn Lane, Parking-Separated Bikeway. For a 38-foot-wide typical section, the winner was Concept E: Buffered Bike Lanes, Remove Parking on Both Sides as shown in **Figure 36**. Some respondents indicated that they would rather have a separated bikeway for their own safety and comfort, and if not, at least a painted buffer.

Figure 35. Survey Results - Relation to Benton Street

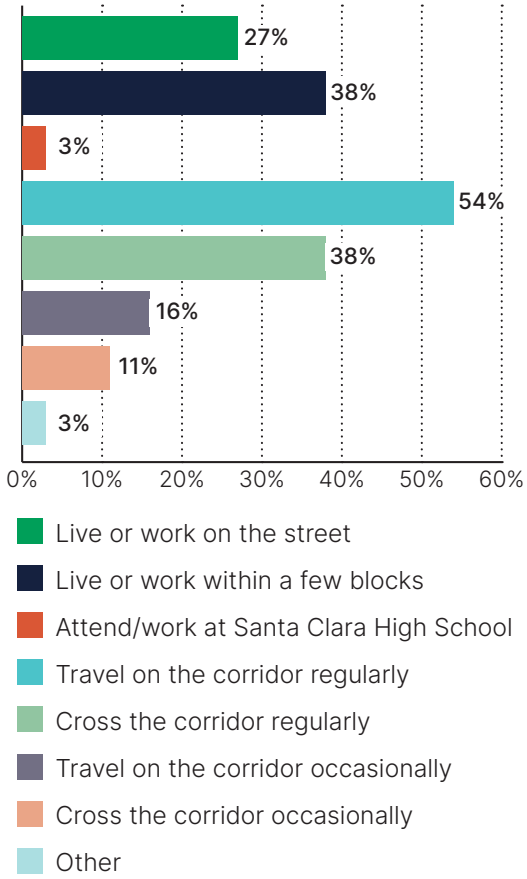
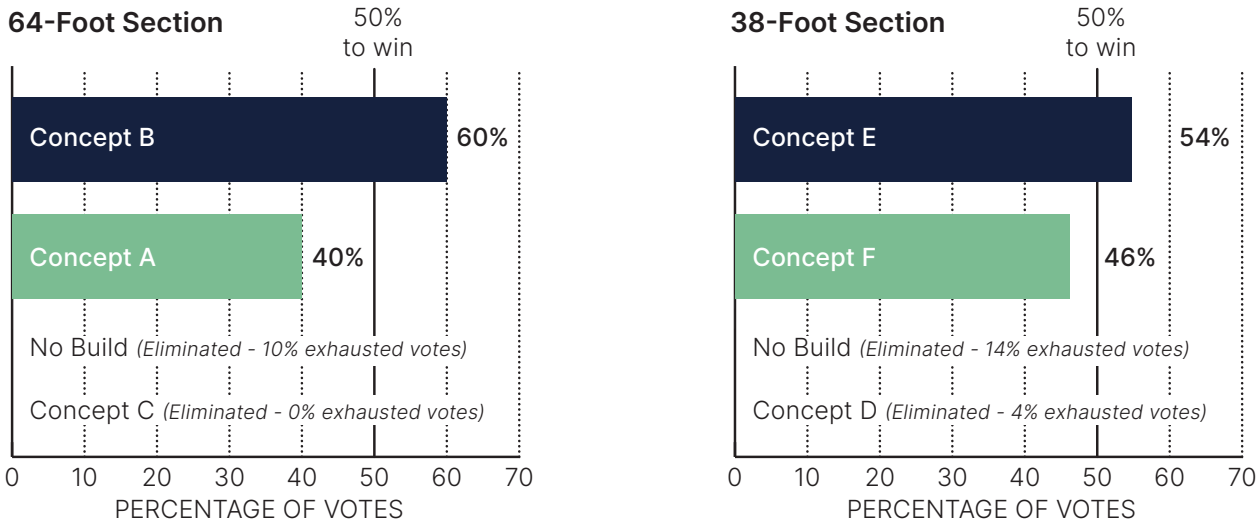
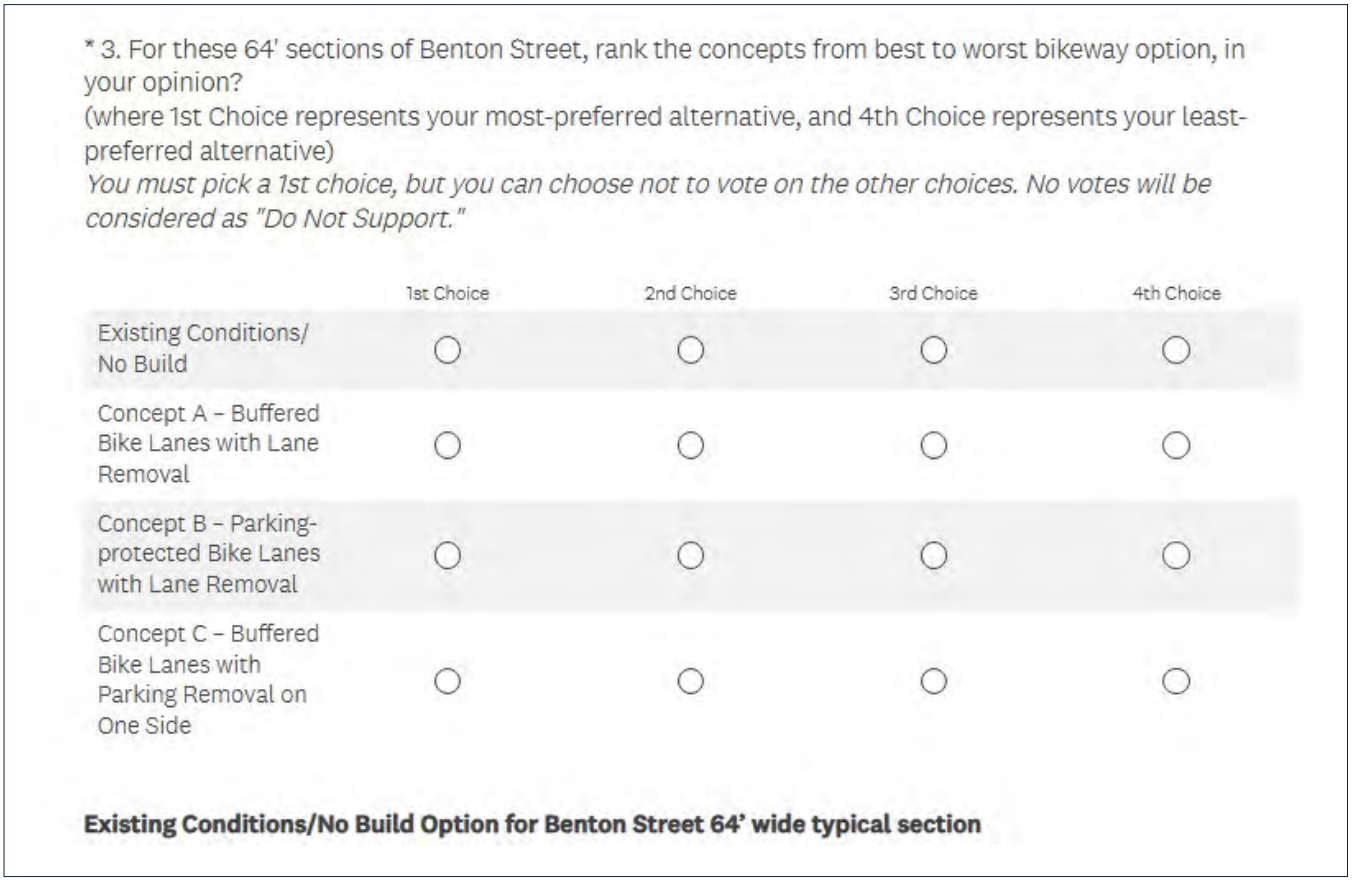


Figure 36. Ranked Choice Voting Results



Exhausted votes are when all the choices a voter ranked have been eliminated and there is no next ranked choice to move their vote. These choices are eliminated.



* 3. For these 64' sections of Benton Street, rank the concepts from best to worst bikeway option, in your opinion?
(where 1st Choice represents your most-preferred alternative, and 4th Choice represents your least-preferred alternative)
You must pick a 1st choice, but you can choose not to vote on the other choices. No votes will be considered as "Do Not Support."

	1st Choice	2nd Choice	3rd Choice	4th Choice
Existing Conditions/ No Build	○	○	○	○
Concept A – Buffered Bike Lanes with Lane Removal	○	○	○	○
Concept B – Parking-protected Bike Lanes with Lane Removal	○	○	○	○
Concept C – Buffered Bike Lanes with Parking Removal on One Side	○	○	○	○

Existing Conditions/No Build Option for Benton Street 64' wide typical section

Example of ranked choice question in Survey 3

05.
Recommendations

Final Recommendation

City Council will review the results of the study and make a recommendation. This chapter is a placeholder until the final draft report is published.

Next Steps and Funding

The design and construction of bicycle facilities on Benton Street has some funding from development fees. At the completion of the planning-level effort, if City Council decides to move forward with a specific alternative, then City will develop more detailed cost estimates and identify any additional funding needed to design, bid, and construct new bikeway facilities.

High Level Cost Estimates

The estimated costs in **Table 18: Generalized Planning Level Costs – Bikeways** are planning-level costs that help the public understand at a high level what investments are required for various infrastructure improvements. Costs are in 2024 dollars.

Table 18. Generalized Planning Level Costs – Bikeways

Bikeway Classification	Cost Per Mile
Class II – Bicycle Lane	$118,000 – $619,000
Class IIB – Buffered Bicycle Lane	$195,000 – $619,000
Class IIIB – Bicycle Boulevard	$110,000 – $205,000
Class IV – Separated Bikeway	$366,000 – $1,134,000

There are also additional cost considerations when installing these bikeways, particularly around crossings or intersections. Complementary pedestrian improvements could also be considered in future design phases. Some of these infrastructure cost considerations are included in **Table 19: Generalized Planning Level Costs – Spot Improvements**.

Table 19. Generalized Planning Level Costs – Spot Improvements

Proposed Improvement	Cost of Each
Construct Median Refuge	$1,500 – $2,900
Install New Sidewalk (per mile)	$987,000 – $1,536,000
Install/Upgrade Crosswalks (per linear foot)	$22 – $37
Install/Upgrade Curb Ramps	$7,300 – $14,600
Reconfigure Slip Lane	$585,200 – $877,700
Reduce Turning Radius	$146,300 – $1,097,200

Local and Regional Grant Programs

2016 MEASURE B

Santa Clara voters approved a half-cent sales tax in 2016 to fund transportation infrastructure investments. Measure B is expected to raise $6.3 billion (2017 dollars) over 30 years to fund nine program categories. The Local Streets and Roads Program returns funds to the cities and the County on a formula basis to be used to repair and maintain the street system. The allocation is based on the population of the cities and the County of Santa Clara's road and expressway lane mileage. Cities and the County will be required to demonstrate that these funds would be used to enhance and not replace their current investments for road system maintenance and repair. The program would also require that cities and the County apply Compete Streets best practices to improve bicycle and pedestrian elements of the street system. If a city or the County has a Pavement Condition Index score of at least 70, it may use the funds for other congestion relief projects. Two hundred fifty million dollars has been allocated toward the Bicycle and Pedestrian Program. Within the Bicycle and Pedestrian Program, funds are divided between capital projects (80%), education and encouragement programs (15%) and planning studies (5%). The education and encouragement funds will be allocated to cities based on a population formula with a $10,000 annual minimum allocation per city; $250,000 will be reserved for countywide programs. Funds for bicycle and pedestrian projects are applied to a select list of projects approved by the VTA Board.

Funds are programmed by VTA.

TRANSPORTATION FUND FOR CLEAN AIR COUNTY PROGRAM MANAGER FUND

The Bay Area Air Quality Management District (BAAQMD) administers funds to the VTA for projects that reduce vehicle emissions including bicycle projects. These funds come from a $4 vehicle registration surcharge in Bay Area counties and can be used as a match for competitive state or federal programs.

Funds are programmed by VTA.

ONE BAY AREA GRANT

The One Bay Area (OBAG) grant program emphasizes funding for projects within Priority Development Areas in the region that are in-line with housing and land use goals. Projects that are within or provide access to these Priority Development Areas could qualify for these grants.

Funds are programmed by the Metropolitan Transportation Commission (MTC) and the VTA.

TRANSPORTATION DEVELOPMENT ACT ARTICLE 3

Transportation Development Act Article 3 (TDA 3) provides funding annually for bicycle and pedestrian projects. Two percent of TDA funds collected within the county are used for TDA 3 projects. Metropolitan Transportation Commission policies require that all projects be reviewed by a Bicycle and Pedestrian Advisory Committee or similar body before approval.

Funds are programmed by VTA.

State and Federal Grant Programs

CALIFORNIA ACTIVE TRANSPORTATION PROGRAM (ATP)

Governor Edmund G. "Jerry" Brown signed legislation in 2013 that consolidates existing federal and state transportation programs including the Transportation Alternatives program, Bicycle Transportation Account, and State Safe Routes to School, into a single program focused on expanding and enhancing active transportation across the state. The Active Transportation Program is intended to increase the use of active transportation, enhance safety for non-motorized users, improve public health, and advance regional greenhouse gas reduction goals pursuant to Senate Bill 375 (of 2008) and Senate Bill 341 (of 2009). This grant program funds a wide variety of activities and projects that further the goals of the program including infrastructure, non-infrastructure, and planning studies.

Funds are programmed by Caltrans with guidance from the California Transportation Commission (CTC).

HIGHWAY SAFETY IMPROVEMENT PROGRAM

Caltrans offers Highway Safety Improvement Program grants every one to two years. Projects on any publicly owned road or active transportation facility are eligible, including bicycle and pedestrian improvements. This program focuses on projects that explicitly address documented safety challenges through proven countermeasures, are implementation ready, and demonstrate cost-effectiveness.

Funds are programmed by Caltrans.

OFFICE OF TRAFFIC SAFETY GRANT

The Caltrans Office of Traffic Safety makes grants available to local and state public agencies for programs that help them enforce traffic laws, educate the public in traffic safety, and provide varied and effective means of reducing fatalities, injuries, and economic losses from collisions. Funding can be used for safety trainings, bike helmets, and traffic safety campaigns, among other activities.

Funds are programmed by the Office of Traffic Safety.

SAFE STREETS AND ROADS FOR ALL (SS4A)

Established under the Bipartisan Infrastructure Law, this discretionary program funds regional, local, and tribal initiatives to prevent roadway deaths and serious injuries. Grant types include Planning and Demonstration Grants as well as Implementation Grants. Eligible activities include pilot and demonstration projects, data analytics, creating safe routes to schools, promotional and education materials, and expanding bicycle networks. An eligible Safety Action Plan must be developed prior to applying for Implementation Grants under this program.

Funds are awarded by the US Department of Transportation.

ROAD MAINTENANCE AND REHABILITATION PROGRAM

Senate Bill 1 created the Road Maintenance and Rehabilitation Program to address deferred maintenance on state highways and local road systems. Program funds can be spent on both design and construction efforts. On-street active transportation-related maintenance projects are eligible if program maintenance and other thresholds are met.

Funds are programmed by the State Controller's Office with guidance from the CTC.

City of
Santa Clara
The Center of What's Possible